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FINAL REPORT

MULTI-PURPOSE ARENA FEASIBILITY STUDY

MASSACHUSETTS CONVENTION CENTER AUTHORITY

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HNTB

HOWARD NEEDLES TAMMEN & BERGENDOFF

November 30, 1984

Mr. Francis X. Joyce
Executive Director
Massachusetts Convention Center Authority
200 Berkeley Street, Suite 800
Boston, Massachusetts 02116

Re: MCCA - Multi-Purpose Arena Feasibility Study

Dear Mr. Joyce:

Howard Needles Tammen & Bergendoff, together with Touche Ross & Company and the other Study Team members, is pleased to submit this Feasibility Study for a multi-purpose arena in Boston.

We believe that this comprehensive Feasibility Study answers the key questions concerning the future for a multi-purpose arena facility in Boston. The study makes specific recommendations concerning a new arena, and provides a sound basis for further decision making.

We especially appreciate your and the Authority's cooperation during the study, and would be pleased to answer any further questions which may arise as the project goes forward.

Very truly yours,

HOWARD NEEDLES TAMMEN & BERGENDOFF

Francis X. Hall, P.E.
Partner

Donald

Donald I. Grinberg, A.I.A.
Project Manager

ION
MAR 15 1985

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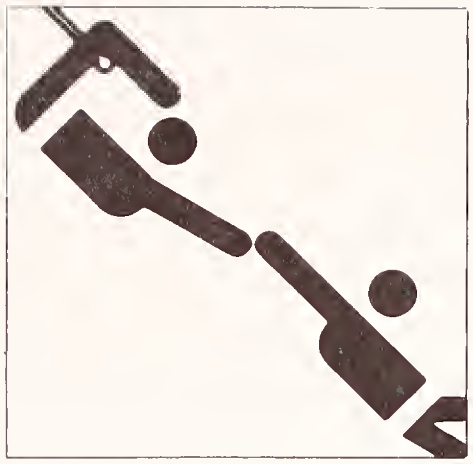

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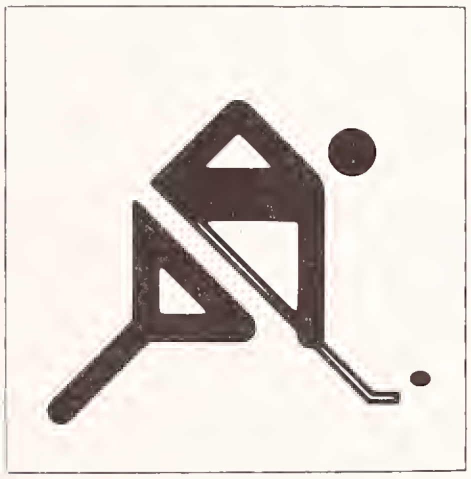

HNTB
Howard Needles Tammen & Bergendoff

in association with:
Touche Ross & Co.
Stull and Lee
Geiger Group
Concordia Management Corp.
Ryan, Elliott and Company, Inc.

MULTI-PURPOSE ARENA FEASIBILITY STUDY

MASSACHUSETTS CONVENTION CENTER AUTHORITY

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INTRODUCTION

INTRODUCTION

PROJECT BACKGROUND

On October 6, 1983, the Governor of the Commonwealth signed into law an act "providing for an accelerated study of the feasibility of a multi-purpose arena" for the Boston metropolitan area. This was the culmination of a series of events over the preceding several years that have focused public attention on the conditions at the existing, 56-year-old Boston Garden facility.

There is little dispute that the aging Boston Garden does not offer playing conditions, a performance environment and patron amenities consistent with Boston's reputation as a first-class, nationally prominent city. However, what to do about these conditions and how to pay for such improvements presents a highly complex and emotionally-charged set of issues to resolve. The following chronology of highlights from the debate of the previous several years on an acceptable "Boston Garden solution" illustrates these complexities.

Change of Ownership of the Boston Garden

In 1973, the New Boston Garden Corporation was founded as a subsidiary of the Delaware North Companies, Inc. for the purpose of acquiring and operating the Boston Garden. This ownership structure for the Boston Garden is still in effect today.

Arena Sites Previously Considered

Even prior to the proposals of the last several years, numerous sites were considered for a new arena. Among these sites were:

- The Massachusetts Turnpike at the junction of Route 128
- An "air rights" location at South Station
- A South Boston/Fort Point Channel location
- Along Northern Avenue
- At Sullivan Stadium in Foxboro
- The North Station area

BRA's Development Plan for the North Station District

The Boston Redevelopment Authority released a Development Plan for North Station District in 1979. This proposal called for comprehensive development in the North Station area, including a renovation of the Boston Garden.

Boston Celtics/Suffolk Downs Proposal

In 1980, the Boston Celtics, in cooperation with Ogden Leisure Co., the owners of Suffolk Downs, studied a privately-funded arena to be located on the grounds of Suffolk Downs in Revere. The proposal never progressed beyond the study phase.

Delaware North's Rockingham Park (New Hampshire) Proposal

In early 1981, the Delaware North Companies, Inc., parent company for the New Boston Garden Corp. and the Boston Bruins hockey team, announced plans for the publicly-supported redevelopment of the fire-damaged Rockingham Park complex in Salem, New Hampshire. The plans called for revitalization of horse racing, plus the addition of a greyhound racing program. Additionally, the promoters proposed to build a multi-purpose sports and entertainment arena, presumably to house a relocated Boston Bruins hockey team. The New Hampshire State Legislature subsequently voted down the state-funded incentives sought by Delaware North, and the proposal was dropped.

Arena Committee Proposal, 1981

In response to the prospect of a Delaware North owned arena in New Hampshire housing the Boston Bruins, an "Arena Committee" was organized by U.S. Senator Paul Tsongas and other community leaders to develop a proposal for a new arena in the Boston area. The Committee's report, prepared with the assistance of the BRA, was issued in August 1981, wherein a new facility to the rear of the present Boston Garden was recommended, including the construction of some associated parking capacity. The Committee also called for the establishment of an independent, State-level "Bay State Arena Authority" to oversee construction and subsequent operation of the facility. Revenue bonding capability of approximately $50 million was recommended for the proposed Bay State Arena Authority. Finally, the Committee recommended that the State hotel tax be increased from 5.7% to 8%, with the increased taxes on hotels within the Route I-495 Loop pledged to cover debt service on the proposed Arena Authority bonds.

Creation of the MCCA

A year of public discussion followed, and the concept of an arena authority evolved into the creation of the Massachusetts Convention Center Authority. During this period, the State Legislature was focusing on the fiscal crisis in the City of Boston and enacted the "Tregor Bill". Included in this act was the creation of the Massachusetts Convention Center Authority (MCCA or the "Authority"). Among the MCCA's initial legislative mandates were the take over of the Boston Common Parking Garage and the construction of a convention center with the capacity to attract national and international conventions. The MCCA's enabling legislation also authorized a feasibility study of a multipurpose arena for the Boston area.

Opening of the Worcester Centrum

The Worcester Centrum opened in September, 1982, altering the network of entertainment facilties in eastern Massachusetts. The facility has been aggressively marketed by its contract managers, Spectacor, operators of the Philadelphia Spectrum arena, owners of the Philadelphia Flyers hockey team and managers of Three Rivers Stadium in Pittsburgh. The Centrum has been a market success, conducting 61 concerts and 126 other events in the first ten months of operation, between September 1982 and July 1983. Previous studies have not had to eval-uate the effect of the Centrum on the Boston entertainment market.

Proposed MBTA Improvements

The MBTA has under contract a design and engineering team for a major alteration of the North Station complex, including relocation of the elevated Green Line and a redeveloped commuter rail terminal. The prospect of major transit system changes at what has been regarded by many as the preferred site for a new arena adds a set of complex planning and design issues that must be evaluated concurrently with the evaluation of multi-purpose arena alternatives.

Central Artery/Third Harbor Tunnel Project

The State Executive Office of Transportation and Construction has been conducting major planning efforts aimed at a widening and depression of the Central Artery. The impact of this project on the elevated ramp system, the potential demolition of the Anelex Building (which contains support spaces critical to the operation of the Boston Garden) and effects on other structures in the North Station area must now be included in the North Station site analysis. Approval of this project is still pending in the U.S. Congress, and the timing of its implementation is uncertain.

Another confirmation that the North Station site has its own, complex dynamics is the ongoing construction of the new GSA Government Office Building. This project is the key focus of an overall urban renewal strategy for the area as promoted by the Boston Redevelopment Authority (BRA).

Hynes Auditorium

Final design of the Hynes Convention Center is now well underway, and it is certain that auditiorium seating capacity will not substantially increase over the current level of 5,000 seats. This raises the issue whether a publicly-owned multi-purpose arena at another site should be used to complement Hynes activities. Furthermore, planning concerning a renovated or new arena must take into account the fact that the Hynes will no longer serve to support civic functions since the expansion and renovation is intended to convert it into a true convention center.

Sale of Boston Celtics

The Celtics three-year Boston Garden lease expired in 1983. Concurrently, Mr. Harry Mangurian announced that the expected terms of a new lease would likely force him to sell the Celtics franchise. Indeed, the franchise was sold in mid-1983 to a group headed by Mr. Donald Gaston, a former Gulf and Western Corporation executive, located in New York.

MCCA Legislation for a Multi-purpose Arena Feasibility Study

On October 6, 1983, the Governor signed into law (Chapter 400) an act "providing for an accelerated study of the feasibility of a multi-purpose arena". The text of the Act is as follows:

Be it enacted by the Senate and House of Representatives in General Court assembled, and by the authority of the same, as follows:

Chapter 190 of the acts of 1982 is hereby amended by striking out section 38E and inserting in place thereof the following section:-

Section 38E. The Authority is hereby authorized and directed to prepare and submit to the governor, the president of the senate, the speaker of the house of representatives, the chairman of the senate committee on ways and means, the chairman of the house committee on ways and means, the senate and house chairmen of administration, a feasibility study relative to the development and operation by the Authority of a multi-purpose arena of sufficient size and with adequate facilities to accommodate major civic, athletic, recreational and entertainment events, which study shall include, but not necessarily be limited to the following:

(a) a description of the location deemed suitable by the Authority for said multi-purpose arena;

(b) a description of the lands, structures, fixtures, and facilities deemed necessary or appropriate by the Authority for the construction or reconstruction of said multi-purpose arena;

(c) an estimate of the capital expenses estimated by the Authority as necessary for the construction or reconstruction of said multi-purpose arena;

(d) an estimate of the operational expenses estimated by the Authority as necessary for the operation and maintenance of said multi-purpose arena;

(e) a proposal by the Authority for the provision of funds sufficient to meet the capital and operating costs, including projected income, associated with said multi-purpose arena;

(f) such feasibility study shall be conducted by an independent firm and shall be independently verifiable; and

(g) a description of the environmental and economic affects on the immediate community, the housing and parking needs of the community and the arena's affect on residential and commercial displacement."

MCCA Request for Proposals

On November 7, 1983, the Massachusetts Convention Center Authority issued a Request for Proposal for consultants to prepare the arena feasibility study.

Beginning of the Multi-Purpose Arena Feasibility Study

On April 2, 1984, the MCCA authorized a contract with Howard Needles Tammen & Bergendoff (HNTB) in association with Touche Ross & Co. and four other subconsultants to perform the feasibility study described in this report.

New Boston Garden Corporation's "Boston Garden/North Station Restoration and Renovation Master Plan"

A Master Plan concerning the restoration and renovation of the Boston Garden Complex was prepared by Sverdrup & Parcel and Associates, Inc., St. Louis, for the New Boston Garden Corp. The 38-page document is dated February, 1984 and was made availble to the MCCA and its consultants on May 1, 1984.

Presentation of the Feasibility Study's Phase I Findings

On July 23, 1984, an Executive Summary of Phase I Findings was released by the arena feasibility Study Team. At that time, it was recommended that the North Station site be selected for detailed design and financial analysis for a new arena. No recommendation favoring a new or renovated arena was made at that time. The MCCA Board subsequently authorized start-up of Phase II of the arena feasibility study which was to provide the technical and financial details for a new arena for comparison to the Phase I findings concerning the Boston Garden.

PROJECT OBJECTIVES

Following a thorough evaluation of the existing Boston Garden and various renovation options, the choice was made to proceed with a full feasibility analysis of a new arena. The enabling legislation cited above did not specifically call for the study to include an analysis of the potential for renovating the Boston Garden. However, the Authority felt that it was in the public interest to include sufficient analysis of the Boston Garden in order to draw comparisons between the renovation and new arena options. The study provides the Massachusetts Convention Center Authority with the objective information necessary to decide whether to proceed with action that would lead to a complete renovation of the existing Boston Garden or the construction of a new arena.

In meeting the overall objectives of the study, several activities were performed to develop the proper comparisons between the Boston Garden and a new facility. The major activities were as follows:

1) The compilation of a set of multi-purpose arena industry standards as critieria for evaluating the Boston Garden and a determination whether the marketplace in Boston for public entertainment is adequately served by the existing facilities.

2) The determination of the characteristics that an arena should have to adequately meet the demand for public entertainment in Boston.

3) An objective evaluation of the present Boston Garden facility, with the assistance of its present owners, to determine its physical condition and ability to meet market potential.

4) A determination as to whether the Boston Garden can be sufficiently renovated to yield a long-term facility that:

   o meets the industry standards appropriate for the Boston marketplace

   o an evaluation of the extent to which the present owners have plans and the resources to accomplish such a renovation

   o and the degree to which the owner's plans address renovation of the arena versus commercial areas in the Garden.

5) A site recommendation if a new arena were to be built.

6) The definition of an initial building program and design concept for a new arena, based upon the needs of multi-purpose use, industry standards for contemporary arena design and the Boston area market demand for public entertainment.

7) An assessment of the costs of both the renovation and the new building options, the possible financing approaches for a new arena, and levels of public subsidies, if any, which might be borne by the general state taxpayers.

8) A comparison of the costs and benefits of the renovation and new arena options, and a suggestion of ways by which the preferred solution could be implemented.

COMPARING A NEW ARENA TO THE BOSTON GARDEN

In order to properly compare a new arena and the Boston Garden, the Feasibility Study included the development of a design and implementation concept for a new arena as well as an evaluation of the Boston Garden in its existing and potentially renovated states. Since the authorizing legislation did not define feasibility, the Study Team developed the criteria described below used in assessing the feasibility of the renovation and new arena options:

1) Ability to serve both the public interest for civic functions and the market demand for a variety and quantity of entertainment and public assembly events.

2) Generation of operating profits consistent with industry standards and in sufficient amounts to provide for the long-term physical upkeep of the building.

3) Access to sufficient capital necessary to fund renovation or new construction.

4) Willingness to create an industry standards facility.

5) Minimization of the completed facility's financial and operating costs to the general taxpayers of the Commonwealth.

6) Impact of the facility on Boston's national reputation as a first-class market for professional sports and other public entertainment.

7) Conformity with contemporary life safety and building code standards.

8) Quality of the spectator's entertainment experience.

9) Efficiency and ease of operation, from the viewpoint of the major acts, professional sports tenants, and other entertainment promoters.

10) Protection of the economic interests of the arena's prime tenants, including the professional sports teams.

11) The degree to which a renovated or new arena can serve to stimulate and maximize economic revitalization in the surrounding area.

12) The degree to which a renovated or new arena can benefit from and/or contribute to the area's long term transportation development.

13) The degree to which a renovated Garden or new arena is consistent with City and BRA policy for the North Station district redevelopment.

14) Generation of economic benefits to the City of Boston.

15) Generation of economic benefits to the Commonwealth of Massachusetts.

Use Of The Report

The objective of this project was to prepare a feasibility study relative to the development and operation by the Authority of a multi-purpose arena of sufficient size and with adequate facilities to accommodate major civic, athletic, recreational, and entertainment events. As such, the scope of project work and this report were designed to assist in the decision process with respect to renovating the existing Boston Garden or constructing a new arena.

The study has identified numerous conditions which must exist and steps which must be accomplished for implementing the recommended course of action and achievement of the projected results. As planning and implementation proceed, outcomes differing from those assumed will cause variations in the results, and perhaps changes in the appropriate course of action. This report provides an orderly presentation of the best available information at the time the study was conducted. The Study Team did not audit the data and information used in the analyses but did review such information as required for the purposes of the study. Therefore, it believes that the conclusions and planning assumptions drawn from such information can be independently verified and relied upon for these planning and decision-support purposes. As described above, this feasibility study was conducted for evaluation and planning purposes. Accordingly, it should not be relied upon for any other purpose.

ACKNOWLEDGEMENTS

Over the course of this project, the Study Team received generous assistance from numerous individuals and organizations. Assisting with the project have been the staffs of the Governor's office of Economic Development, the GSA, EOTC, MBTA, DPW, BRA; various City of Boston departments; consultants to the DPW and MBTA; staff of the Mass. General Hospital; representatives of the private sector development and financial community; and owners and operators of numerous arenas around the country. Special acknowledgement is given to Mr. Paul A. Mooney, President of the New Boston Garden Corporation and, of course, to the staff of the Massachusetts Convention Center Authority. A complete listing of acknowledge-ments is presented at the end of this report.

ORGANIZATION OF THIS REPORT

This report is organized into sixteen chapters, each of which deals with a principal task of the Feasibility Study. Generally, the sequence of chapters follows the order in which the work was conducted. Phase I of the Study, which concluded in late July, 1984 with a recommendation that the North Station site be carried forward as the preferred study site for a new arena, included work covered in the following chapters:

1) Multi-purpose Arena Industry Overview

2) Entertainment Market Potential for the Boston Metropolitan Area

3) Facility Program for an Arena in Boston

4) Evaluation of the Boston Garden

5) Inventory and Analyses of Potential New Arena Sites

6) Preferred Site Analysis

Phase II work focused on the detailed design and financial feasibility analysis of a new arena at North Station. Analysis of the Phase II tasks is reported in the following chapters:

7) Design Concept for a New Arena

8) Urban Design Guidelines and Environmental Impacts

9) Real Estate Considerations

10) Revenue and Expense Profile for a New Arena

11) Project Costs

12) Construction Strategies and Schedule

13) Analysis of Alternative Financing Strategies

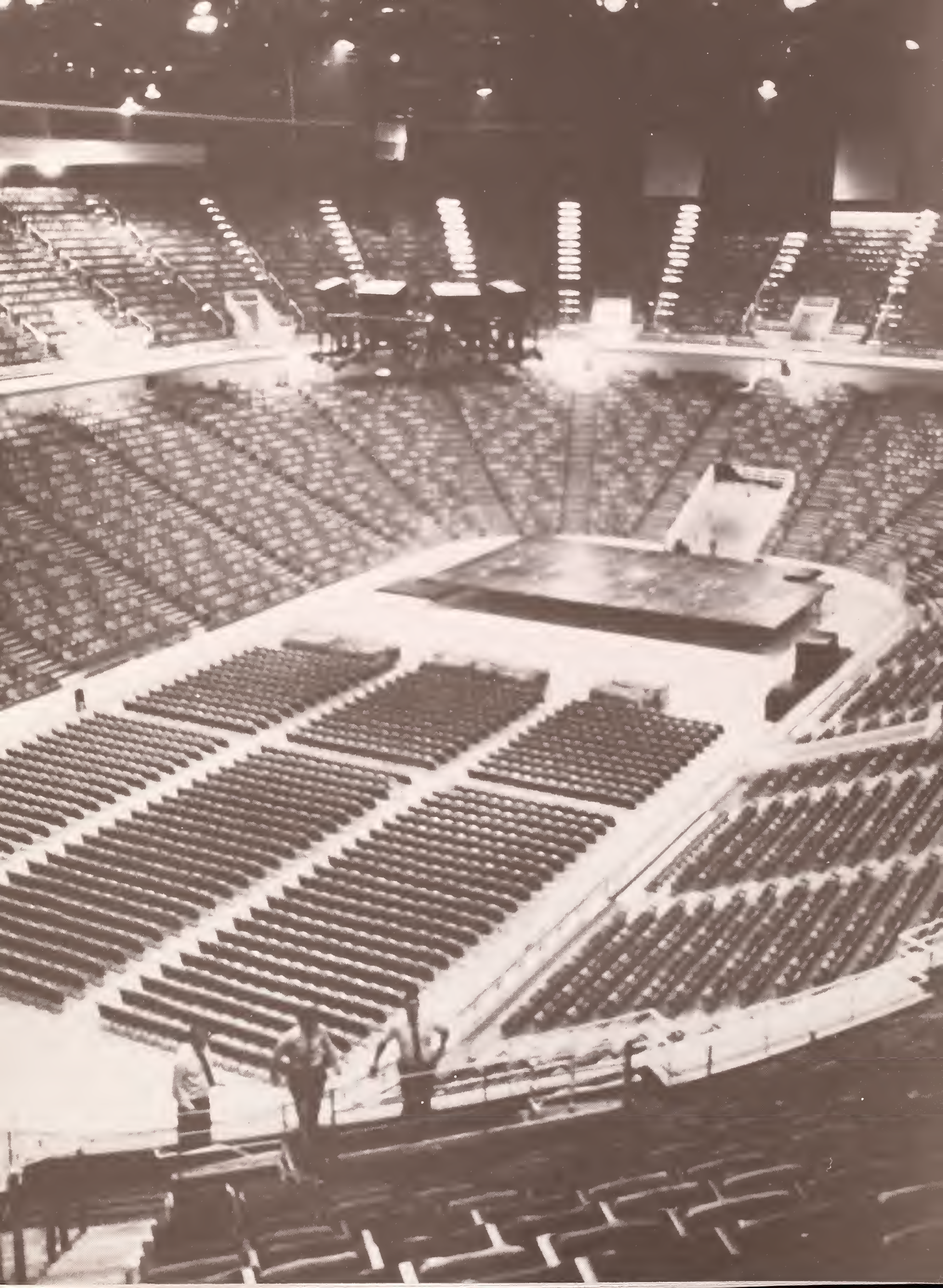
14) Economic Impact Analysis

The final two chapters of this Report present the Study's conclusions and recommendations for next steps. Chapter 15 compares the analysis of the Boston Garden conducted during Phase I with the subsequent analysis of a new arena. Chapter 16 outlines the key implementation issues concerning the development of a new arena at North Station.

Figures illustrating points made in the text are contained in the body of the report, and supporting Exhibits are contained in the separate section at the end of the report. The various appendices are included in a separately bound volume accompanying this report.

MULTI-PURPOSE ARENA INDUSTRY OVERVIEW

1



MULTI-PURPOSE ARENA INDUSTRY OVERVIEW

SUMMARY OF WORK PERFORMED

Detailed surveys requesting design, financial, and operating statistics were mailed to all facilities in the U.S. and Canada with either an NBA or NHL professional sports franchise, as well as to several other regional facilities. A total of 40 arena facilities were included in the survey mailing. Responses of some kind were received from 27 of these facilities. A copy of the survey form is reproduced in the Appendix.

An extensive effort was conducted in order to maximize the response to the survey. All 40 facilities were contacted prior to distributing the survey. Telephone contacts were made in order to obtain information not completed in the survey responses and to encourage non-respondents to either complete the survey or to at least provide some of the information orally.

Certain arenas were selected for on-site inspections, including detailed interviews with each facility's management, to gain further understanding of design, operating, marketing, management, locational, and competitive issues. These facilities were chosen for several reasons, including diversity of ownership types, relationships to or similarities with the Boston marketplace, examples of state-of-the-art design, and, in the case of Montreal, an example of a major renovation.

The facilities selected for the detailed on-site reviews were:

- Providence Civic Center
- Hartford Civic Center
- Montreal Forum
- Worcester Centrum
- Capital Centre (Landover, Maryland)
- Philadelphia Spectrum
- Dallas Reunion Arena
- Houston Summit
- Kemper Arena (Kansas City)
- Byrne Arena (Meadowlands)
- Boston Garden

Exhibit 1-1 shows a complete listing of the surveyed and interviewed facilities. Exhibit 1-2 summarizes the criteria used in selecting facilities for on-site inspections.

In addition, telephone interviews were conducted, industry and trade publications were reviewed, and prior studies and surveys performed by Touche Ross & Co. and others were reviewed. Among the industry and trade publications reviewed were:

- The Sporting News NBA Guide, 1983-84
- NHL Official Guide, 1983-84
- Daily Racing Form Survey on Sports Attendance, 1974 through 1983 Editions
- IAAM AUD-ARENA STADIUM GUIDE, 1984 Edition
- IAAM Industry Profile Survey, 1979
- Poll-Star, Promoter's On-line Listing service, August, 1984

Finally, pertinent arena user groups were interviewed, such as:

- National Basketball Association
- North American Soccer League
- National Collegiate Athletic Association
- National Hockey League
- Major Indoor Soccer League
- Kenneth and Irving Feld Promotions
- Regional concert promoters and booking agents

MARKET, FINANCIAL, AND OPERATING PATTERNS

The following findings are based on the information received as a result of the industry survey activities. The data received was not separately confirmed nor were complete responses received from all facilities. However, it is believed that the findings presented below are representative of general industry patterns.

Industry Definition

There are 37 facilities in the U.S. and Canada which are used by either an NBA or NHL franchised tenant. Only seven of these facilities (including the Boston Garden) have both. Six of these seven are privately operated and each of the private facility operators also owns at least one of the tenant teams (see Exhibit 1-3).

There are frequent examples of a publicly owned facility being operated by private management, as in the case of the Houston Summit, the Worcester Centrum, the Philadelphia Spectrum, and the Omni in Atlanta.

The six arenas which have both an NBA and an NHL tenant are the facilities most comparable to the Boston Garden in terms of event mix, potential attendance, and operational characteristics. These arenas are: New York City's Madison Square Garden; the Los Angeles Forum; the Chicago Stadium; the Philadelphia Spectrum; the New Jersey Meadowlands Byrne Arena; and Capital Centre in Landover, Maryland. All are in or near major population centers. All have two major league sports tenants which result in scheduling constraints from October through April (especially on week-ends). All of these facilities, except Byrne Arena, are privately operated and combine the economics of facility operations with ownership of at least one of the major league sports franchises.

Facility Age and Improvements

The arenas surveyed were built between 1925 and 1983, with the majority of facilities built between 1966 and 1975. The average age of the arenas is 17 years (see Exhibits 1-4 and 1-5).

The facilities which support NBA and NHL tenants have undergone significant renovations, modernization, and expansion. Of the 25 facilities which responded to the survey and which have an NBA or NHL tenant, 19 indicated some type of significant capital improvements since 1970. The most frequent improvements were expansion and the addition of suites and other patron amenities such as air conditioning, restaurants, and more sophisticated scoreboards.

Construction Costs

Original arena construction costs varied widely, due to the time span of original construction, site differences, varying facility specifications, and regional construction cost differentials. For purposes of comparison, the original facility costs (excluding land) for arenas built since 1970 were adjusted to 1984 dollars, using regional (if available) or national construction cost inflation factors. "Domed" facilities were excluded from the analysis since their size (to accommodate football or baseball) is not comparable to the concept of a Boston arena facility. The results showed that the range of comparable arena facility costs, in 1984 dollars, was $19 to $108 million, with the average being $46 million (see Exhibit 1-6). These figures reflect construction costs only.

Site Premiums

Few of the arenas responding to the survey indicated any significant cost premiums resulting from the chosen construction site. One notable exception was Madison Square Garden, completed in 1968 on a complex air rights location over Pennsylvania Station in New York City. It has been estimated that Madison Square Garden's original construction cost (in 1968) was approximately $50 million. Adjusted to 1984 dollars, the cost would be $141 million for the same facility today.

Financing Approaches

Arena construction financing consisted of three basic approaches: (1) publicly-issued debt, (2) private sources, and (3) a combination of public and private sources. The major types of primary and secondary financing mechanisms within the public and private categories are summarized in Exhibit 1-7.

In general, the financing approach was tailored to the unique aspects and constraints of the construction project as well as to the interests of the facility owners and major tenants. In some cases, private financing was combined with public monies when the private parties had a clear economic interest in the operation of the arena. For example, the sports team owners might pay for part of the construction costs and guarantee some minimum usage or revenue levels in return for certain rights when the facility was completed and operational. In other instances, private interests paid for all of the construction costs for the publicly owned arena in return for exclusive, long-term operating or leasing rights.

Economic benefits determine the specific nature of the public/private partnership when formed. Benefits to private parties include: access to less expensive tax-exempt financing; real estate tax abatements; guaranteed long-term tenancy rights; opportunities for ancillary revenues (retail, concessions, advertising, etc.); and often, below-market facility rental costs. Benefits to public bodies include: access to professional management and marketing expertise; sharing of operating and debt service costs; stable, long-term and high-profile tenants; sharing of the original construction cost; and a facility which could be partially available for public/community interest events.

Ownership

Almost three-fourths of the facilities surveyed which had either an NBA or NHL tenant are owned by a governmental entity. Cities own the majority of arenas, with state agencies or independent authorities also being significant forms of public ownership (see Exhibit 1-8).

Internal Executive Management

Facility executive management is most often staff employees of the owner, for both publicly and privately owned facilities. Included in this category are private owners who form their own facility management subsidiaries. The second most frequent management approach is the contracted use of outside private management corporations which have no relation to the facility owner (see Exhibit 1-9).

Although only one-fourth of the respondents' facilities are privately owned, nearly one-half of all the responding arenas are operated by a private organization. In most instances where the building is privately managed, the facility manager is related (directly or indirectly, through the parent corporation) to one or both of the professional sports tenants.

Approach to Internal Services

A variety of approaches to the delivery of internal services is employed in the industry (see Exhibit 1-10).

The methodologies for some of the major services are:

- Concessions: generally contracted out to an unrelated food service company. The arena typically receives a percentage of total gross concession sales (which can be as high as 35 to 40 percent for a primary market such as Boston). These percentages can vary for many reasons other than the size of the market. The percentage in a particular situation is negotiated and reflects many factors such as the agreements regarding the cost and financing of concession furnishings and equipment.

- Security: provided by employees of the arena or through contract security, or both. The survey indicated both approaches were used about equally. Larger metropolitan areas tended to use contract security, with exceptions being Madison Square Garden and the Nassau Coliseum. Byrne Arena (Meadowlands) uses both contract services and in-house employees for security.

- Cleaning and Custodial: primarily performed by arena employees, with larger metropolitan areas tending more toward frequent use of contract custodial services. Again, the facilities in and around New York City were the exception, using in-house employees for cleaning.

- Box Office: three-fourths of the responding facilities manage and operate their own box offices at the facility.

- Ticket Distribution: most arenas distribute tickets for nonfranchised sports events either through independent, computerized central ticketing agencies (Ticketron, Ticketmaster, local or regional chains) or through a combination of in-house staff and an external ticketing agency. The sports teams often have their own separate box office organization, located at the arena or at the teams' general offices.

- Parking Management: split evenly between employees and contract/independent parking management services (such as Alright, Apcoa, or public parking authorities) for those facilities with dedicated or joint-use parking.

- Maintenance: performed almost entirely by employees of the facility. Facilities often employ full-time tradespeople to perform both regular on-going maintenance as well as minor repairs and improvements.

- Advertising/Promotions: nearly three-fourths of the responding facilities handle advertising and promotions internally. The remaining respondents either use agencies or perform the service in conjunction with a variety of outsiders including tenants, promoters and agencies.

Seating Capacities

Seating capacities for NBA/NHL facilities vary within a fairly wide range, depending upon the type of event being staged. Following are summary results from all facilities in the survey (see Exhibits 1-11 and 1-12):

	Maximum Seating Capacities		
Event Type	Lowest	Highest	Average
Basketball	11,052	20,124	16,192
Hockey	8,946	19,275	15,869
Concerts	11,649	21,600	18,145

The facilities serving an NBA and an NHL tenant in markets similar in size to Boston have seating capacities in the upper end of the ranges shown above.

Size of Market Served

A wide range of population and media market sizes support the arenas analyzed in the survey. Exhibit 1-13 provides a listing of local market sizes for each facility, ranked by size of media market. A summary of this data is as follows:

Market Size Indicator	Range of Population (in millions) for Markets With an NBA or NHL Team Which Support an Arena		
	Highest	Lowest	Average
Standard Metro. Statistical Area (SMSA)	9.1	0.7	4.2
Arbitron "Area of Dominant Influence" (ADI)	17.8	1.5	2.7

Boston's ADI population is 5.4 million people, making the Boston entertainment market the fifth largest in the country.

Event/Attendance Profile

The annual number of events and the total annual patron attendance vary widely among arenas responding to the survey. Some arenas are highly utilized, such as Madison Square Garden (480 events annually), Philadelphia Spectrum, Minneapolis Met Center, Meadowlands, Portland Coliseum, and Washington, D.C. Capital Centre (all having in excess of 230 events per year). Exhibit 1-14 illustrates these figures for arenas which responded to this portion of the survey; Exhibit 1-15 shows the range and average of event and attendance statistics for franchised sports and nonfranchised sports events separately.

franchised sports tenants are very significant to a facility due to the large number of events and the high attendance which can be generated. The major league tenants (NBA and NHL) are the most significant of the franchised arena tenants because of their size and stability. The NBA and the NHL averaged regular season attendance of 10,620 and 14,267 respectively for the 1983-84 season (see Exhibits 1-16 and 1-17). This represents an average utilization of the facilities of 64 percent for the NBA and 86 percent for the NHL (see Exhibits 1-18 and 1-19). A large portion of tickets sold for NBA and NHL games are sold for an entire season at a time. These season tickets generally are for the high quality seats and are sold before the seasons start. In addition, major league tenants are credited with creating the demand for luxury suites which are a material source of revenue. Because of these factors, the ability to attract and retain an NBA and/or an NHL tenant is a very important consideration in planning an arena's operations.

The number of regular season franchised sports events is mandated by the sports leagues. Additional franchised sports events arise from exhibition and playoff games. The number of events other than franchised sports is influenced by a number of factors, including:

- management's approach to marketing the building and the recruiting of events
- the attractiveness of the media market in which the facility is located
- the financial terms negotiated by arena management
- the availability of prime dates
- the building's reputation, both within the entertainment industry and the local marketplace, as a high-quality, well-run, pleasant place for entertainment
- management's philosophy toward making the building available for community or public interest events
- the overall, market-driven supply of quality entertainment acts that are appropriate for a large, indoor arena

- the lack of competing options (whether from other facilities or from other forms of entertainment) for local entertainment spending

Of those events other than franchised sports, events such as circuses, ice shows, and concerts have the largest direct impact on arena operations. Circuses and ice shows generally run for one to three weeks and often have more than one show per day. As a result, bringing a single circus or ice show into a facility could actually mean scheduling from ten to forty showings of the event.

Concerts are important because they can attract large crowds. A top performer can generate several sold out performances, even with high ticket prices and the gate receipts from major concerts can be quite significant. Other events are significant for the same reason; the NCAA basketball championship tournament is very popular. The "final four" tournament games can produce sell out crowds. Other significant or "world championship" type events, such as figure skating or international sports competitions, can also appeal to large audiences.

In addition to events which can fully utilize the facility, arenas also schedule many events which have a narrower appeal. Examples of such events are high school sports, cultural shows, trade fairs, local union or political meetings, religious gatherings, and convention-related meetings. These "community interest" events are scheduled for several reasons. Many arena managers believe that community interest events increase market penetration by attracting a different crowd of people who might otherwise never attend the facility. Management's objective is to convert these one-time attendees into frequent event goers.

Another reason for scheduling community or civic events is that it is in the public interest to offer a diversity of entertainment which appeals to a broad spectrum of the community, not just those patrons who are interested in and can afford the ticket prices for professional sports, concerts, and family shows. Service in the public interest is an important policy which governs event scheduling at most publicly owned arenas. Even private owners schedule less profitable community interest events to enhance the public image of their facility and/or the facility owner's image. Facilities often schedule these events on dates which would otherwise be open. In such cases, the events can cover the facility's operating costs and generate some incremental revenue even if these community interest events are less profitable. Examples of event types other than franchise sports events can be found in Exhibit 1-20.

Characteristics of Tenant Agreements

The managers of arenas and arena tenants negotiate the terms of facility rentals. The terms can vary widely on all items. The items that vary are how the gate receipts are allocated; whether or not parking, concessions, novelties, advertising and television revenues are split; who pays the various operating or event expenses; and what minimums or guarantees are made by each party. Each facility negotiates its own types of agreements reflecting its policies on items such as whether or not to share concession revenue. These agreements also reflect the facilities' different operating costs due to location, union agreements, and facility design.

However, when comparing the terms of a rental agreement, the design of the terms is less important than the net bottom line of the deal. Facilities are often competing against each other to book top acts. An act is more interested in how much it will make for a performance then in whether the money comes from the gate, parking, or concessions. Because of the wide variety of terms, a facility that charges 18 percent of the gate and shares concessions and parking revenues might net more to the performer than a facility that only charges 10 percent of the gate but does not share any revenues. The terms must be evaluated as a whole in order to understand a facility rental agreement.

Co-promotion is another consideration. By either promoting or co-promoting an event, the facility assumes some or all the risks of sponsoring the event which would otherwise be borne by the promoter. The arena shares the promotional expenses and the event costs. It also has a larger share of the revenues. In this way, the facility has the potential to realize more total revenues than in a traditional lease agreement with a tenant. Different facilities have different policies on co-promotion. It is more common to find co-promotions in a privately managed facility.

Financial Profile

Only a limited number of arenas responded to the set of survey questions dealing with financial results. Since many of the facilities are privately owned or operated, management often chose to reserve this data due to its proprietary nature. Exhibit 1-21 provides a summary of the financial results for the selected facilities which made such data available. A wide range of financial performance was evident from even this limited sample. The basic conclusions that may be drawn regarding financial performance are:

- It is possible for both publicly and privately owned and operated facilities to generate a profit from operations, and thereby provide a positive contribution to debt service, income taxes, building and equipment depreciation, and other such costs.
- It is unlikely that buildings costing substantially in excess of $30 million (in 1984 dollars) can generate enough cash flow to routinely cover debt service, without substantial outside equity contributions to the building program for which the investor does not require a guaranteed return.
- Financial performance is highly dependent upon the quality of management, the aggressive marketing of the building, tight control of operating costs, and the market in which a facility operates.

Revenue Sources

The largest source of revenue to a facility is usually the gate or admissions charge. (Television revenues for an event might be greater, but they typically belong to the tenant and are not shared with the facility.) Food and beverage concessions also are a significant source of revenue. Additionally, most facilities have some revenues arising from dedicated parking. Souvenir, novelty, and program sales are other event-related sources of revenue.

In addition to the event-generated revenues, several other major revenues are not directly related to events. Advertising space in the facility is more dependent upon the total number of persons who will be exposed to it. Suites have become another significant source of revenue to facilities. These suites are typically leased by a company for a year. Companies most often use the suites for entertaining clients and customers, especially at NBA and NHL games.

Operational Efficiencies

Many of the newer facilities have been designed to optimize operational efficiencies. The more common physical design enhancements built-in are concerned with facilitating the ease of loading and set-up operations for different kinds of events. Some are designed for extra easy conversion between the basketball configuration and the hockey configuration. Nearly all of the facilities considered storage space to be a key factor in the design to facilitate ease of operations. Some of the more common design attributes contributing to operating efficiencies are:

- Arena floors at or near grade and directly accessible by truck for ease of loading and unloading.
- Spacious and accessible loading dock areas for four or more trucks.
- Basketball surfaces designed for easy assembly and disassembly. Storage for the basketball surface is nearby to minimize the distance which it has to be moved, thereby saving changeover time.
- Seats which are temporary and semi-permanent are designed to enable both efficient set up as well as storage.
- Ample storage is provided.
- Heating, lighting and air-conditioning systems are designed to take advantage of the latest energy and cost saving technologies.

The result of these built-in operating efficiencies is a reduction of operating costs. The reduced costs have two positive impacts on the operations of the arena. First, they can be a positive contribution to the facility's overall profitability. Secondly, many of the cost efficiencies can be passed on to the tenant. This enhances tenant's profit potential from the event and allows the arena to compete for events which might be marginally profitable in less cost-efficient facilities.

Construction Implementation Approaches

The processes which have led to successful arena construction vary widely in terms of specific steps followed or components of the planning program. A few generalizations can be made which characterize strategies that existed in several successful approaches:

- A superior site was chosen, in terms of ease of patron access and proximity to major population centers and roadway/transit systems.

- The arena was built as part of a larger urban development plan for the neighborhood, offering joint-use options for other businesses and services in the immediate vicinity.

- The legal entity set up to control the arena was a fairly autonomous board and focused mostly on policy matters, leaving day-to-day management and operational matters to professionals. Often, the governing board also controlled other entertainment, convention, or exhibition facilities.

- Internal management was staffed by professionals drawn from the industry. These professional managers occasionally participated in the final facility design and construction management. Also, internal management often had a vested interest in the financial performance of the building, the sports team(s), or both.

- In some cases, private contributions to the building costs were a substantial portion of the construction funding.

- A strong, prominent, and influential leader (the mayor, the governor, a local entrepreneur, the team owner) was often the driving force that obtained consensus among the many constituencies whose support was needed to build the arena. The process often took many years to accomplish.

Keys to Operational Success

Interviews with facility managers and others in the trade pointed up certain characteristics which are most prevalent in facilities that enjoy good financial performance and a good community and trade reputation. These attributes include:

- Highly professional internal management was hired and given relative autonomy to run the building as a business.

- The building was aggressively marketed in order to interest and actively recruit quality acts. Many buildings had co-promotion capabilities which offered promoters the option of sharing the financial risk of certain events in order for the facility to share in the economic rewards.

- Much effort was directed towards maximizing the quality of a patron's experience at events. Management focused on:
  - quality of events
  - very clean, bright facilities
  - "no-hassle" ingress and egress, with clear signage
  - maintenance of parking facilities with the maximum capacity possible and as close as possible to the arena
  - accessibility of concession counters and other amenities.
- Promotion of local public interest events was routinely done in order to enhance the image of the facility and the image of the owner/operator, and to encourage new patrons to attend events at the facility. It was asserted that once a patron comes to the facility and enjoys the experience, he is much more likely to attend future events.
- Much attention was paid to the facilities' reputations within their communities. This was true for both public and private facilities. Public facilities were thought to be "statements" of the locality's image. Private facilities were seen as reflections of the private owner's local reputation.
- Management was always concerned with the needs of the press and electronic media.
- Aggressive and creative revenue-generation techniques were used by management. Management was typically looking for new ways to produce more event and nonevent revenues, such as:
  - participating in event co-promotions
  - bringing regional ticket distribution under in-house control
  - renting on-site equipment to outsiders for television production and/or control
  - becoming in-house producers of televised sports events and selling the programs in the marketplace

- planning aggressive advertising and promotional strategies
- maximizing parking revenues
- offering multiple concession/restaurant options
- catering (through special services, clubs, and seating choices) to the luxury-oriented patron

FACILITY DESIGN ISSUES

Location

Nearly 90% of the surveyed facilities are located within the central business district or within a few miles of the central business district (see Exhibit 1-22). The key element impacting choice of location was proximity and accessibility to the maximum population base. This usually meant being near a major highway.

There appears to be one consistent industry-wide standard for the siting of arenas: they should be near major highways. Very few cities have rationalized location solely on the basis of access to mass transit. In Montreal, however, the plans to construct the Metro were instrumental in the decision to renovate the existing building, which is adjacent to a station.

Each facility has its own particular history of location rationale, and it is difficult to draw specific conclusions for the Boston situation based on the experience of other cities. The Study Team did observe that in many cases the best or most rational sites were not always chosen, because arenas on other sites could be more easily implemented. Of the facilities visited, the downtown sites of Providence, Hartford and Montreal offer the best parallels to the Boston situation. Visits to the Capital Centre, Houston Summit and others pointed out the soundness of the policy of locating Boston's arena in the downtown core.

Site Attributes

Facilities are located primarily in a commercial neighborhood with generally excellent road access (see Exhibit 1-23). However, the types of areas in which facilities are located covers the entire spectrum including commercial, residential, retail, industrial, open space and agricultural.

Most arenas are a part of a multiple facility development having various types of related public use structures. Besides dedicated parking, the most common related structures are hotels/ restaurants, convention facilities, exhibition halls, sports stadiums and retail stores (see Exhibit 1-24).

In addition, the areas surrounding the facilities have a significant number of parking spaces which can be used by patrons. Facilities are surrounded by an average of 7,800 auto parking spaces and 110 bus parking spaces within less than 3 blocks (see Exhibit 1-25). These figures are likely to be conservative estimates since several facilities did not include some other large non-related lots which are a few blocks further away. These more distant lots are frequently less expensive and are used extensively by patrons.

Urban Context

Few facilities in North America have the urbanistic qualities of the mixed-use Boston Garden/North Station complex, and few are as close to key downtown areas. In general, the Study Team found a noticeable lack of thoughtful design solutions which sensitively related large bulky arenas to their surroundings, whether urban or suburban. Arenas in the East seem to be better in this respect.

The Hartford Civic Center impressed the Study Team by its juxtaposition to a mixed-use development whose central circulation atrium also serves the arena and convention center (see Figure 1-1). Based on observation at other facilities, the Study Team believes that developers, owners, programmers and designers of arenas face an especially important and usually unmet challenge in relating arenas successfully to their surroundings.

Patron Mode of Travel

The great majority of patrons travel to arenas in private autos (see Exhibit 1-26). This is consistent with the primary transportation mode in the United States. Few cities have extensive urban rail networks. However, mass transportation is important to cites such as Montreal, and New York (Madison Square Garden is located above Pennsylvania Station), for which mass transit is a well-developed local option.

In terms of spectator priorities, superior auto access and parking with moderate mass transit access would appear to be more desirable than superior mass transit with moderate auto access and parking. For example, the Spectrum in Philadelphia is on a subway line and has excellent auto access and parking. Management of the Spectrum represents that 90 percent of their patrons come to events in private autos. Yet, Spectrum management also believes that mass transit access is important, particularly for those events which appeal to patrons who are heavy users of this mode of travel.

It is important to note that even though most patrons use private autos, 90 percent of the responding facilities were served by some form of mass transportation. All of the responding facilities which were served by mass transportation were served by bus. This is probably representative of the most common type of mass transportation available in North American cities. Less than one-third were serviced by either subway, trolley or commuter rail lines (see Exhibit 1-27).

Prototypical Facility Organization

The design of multi-purpose arenas has been gradually evolving towards a standard organizational prototype. Key principles of this prototype are:

- A single pedestrian concourse accessed from multiple points; a minimal number of vertical circulation zones, other than cross aisles between seating rows and short stairways from the concourse to the balcony;
- Location of the pedestrian concourse as close to exterior grade as site conditions allow;
- A separate service and support zone on a level below the spectator concourse; and
- Long-span structural systems that allow facilities to be built with no obstructed view seats (see Figures 1-1 through 1-6 and Exhibits 1-28 and 1-29).

Within this general organizational approach there are many opportunities for site specific, programmatic and architectural variation. A typical design problem found in arenas using these principles is an over-bearing symmetry in plan. Arenas not built incorporating these basic features, while sometimes unique and distinctive, typically have some functional and operational compromises.

Patron Amenities

Concession stands, luxury suites, in-house restaurants, pleasant rest rooms, telephones, accessible parking, drinking fountains, and closed circuit TV are basic in the contemporary area. Nearly two-thirds of responding facilities had in-house, sit-down restaurants as a part of the facility and over one third had some type of in-house members' only club (see Exhibit 1-30). However, simply providing these elements does not guarantee that the amenities are of high quality. In the arenas evaluated as part of this study, a wide range in the quality of spectator amenities was observed. While the features of an arena which are accessible to the public must be particularly rugged and durable, the Study Team believes that this important requirement need not exclude good design, as was observed in several of the arenas visited.

Seating and Sightlines

The industry standard for seating size is now 18", 19" or 20" wide, and most building codes have this requirement. Good molded plastic, self-rising seats (such as at Kemper Arena) are available, and some arenas have upholstered theatre-type seats. Arena managers often mentioned seating comfort as an important factor affecting the public's overall image of an arena.

Contemporary structural design analysis and construction techniques now allow arenas to be built with no obstructed view seats (see Figures 1-7, 1-8 and 1-9). Nevertheless, not all newer arenas have inherently good sight-lines. An arena seating capacity of over 18,000 for basketball can easily result in the most remote seats being too far from the event action. The slope of the tiers of seating is also a critical factor determining the quality of sight-lines; balancing contemporary life safety code requirements with sufficiently sloped seating tiers remains a significant design challenge.

Nearly three-fourths of the responding facilities having NBA or NHL facilities have some type of special privilege seating (see Exhibit 1-31). Almost all of the newer arenas have suites, and there has been a definite tendency to add suites in older buildings. "Sky" suites, those at the top of the arena above the balcony, offer only marginally acceptable viewing angles; a spectator must move towards the front of the box to be able to look down at the action. The concourse-level suites, such as found at Byrne and Kemper Arenas, offer an innovative approach to providing suites with excellent viewing opportunities. Some of the relatively newer arenas, such as the Summit and Capital Centre, have toilets within the suites.

Requirements for Multi-purpose Use

Both good physical design and effective facility management are essential to achieve a truly multi-functional arena. The design of the arena seating for multi-purpose use must take into account the conflicting sitghtline requirements between, for instance, basketball and hockey. A facility designed for NHL hockey obviously provides floor dimensions which are more than adequate than those required for basketball and many other types of events. However, the inclusion of a 200 meter track would require substantial portions of moveable seating at the lower edge of the arena floor, and would effectively move the permanent, more comfortable seats away from the hockey and basketball boundaries.

Some arenas include provisions for having smaller, more intimate events with a partial seating capacity by use of a large curtain that partitions off an unused seating area. While not entirely satisfactory from a spatial or acoustic point of view, this feature does increase the flexibility of an arena to house events which have inherently lower attendance levels.

Support Functions

The back-of-the-house support functions are most critical in allowing an arena to serve a variety of event types (see Figures 1-10, 1-11 and 1-12). Adequate storage, numbers of dressing rooms, and ample service and truck dock and access are essential. Deficiencies in the amount of space for support functions were most frequently cited by arena managers as the chief cause of limiting the flexibility of their buildings.

A lack of adequate amounts of arena support functions was found in those arenas in which spectators and service functions share the same level or in which only a portion of the service concourse level below the first tier of seating is available. A shortfall of service space often had a ripple effect: additional dressing rooms replaced dedicated storage, which in turn was relocated to mechanical rooms. This type of situation results in a fragmentation of the storage function, thereby causing operational inefficiencies.

Another support function whose design can affect the efficiency of an arena's operation is the loading dock/receiving area. The ability to have several trucks unloaded at raised docks simultaneously under full weather protection is a distinct asset to a building. An unloading/ receiving area for concession deliveries separated from the larger main unloading area improves efficiency of both operations.

FIGURE 1 - 1
HARTFORD CIVIC CENTER - RELATED SHOPPING MALL ATRIUM

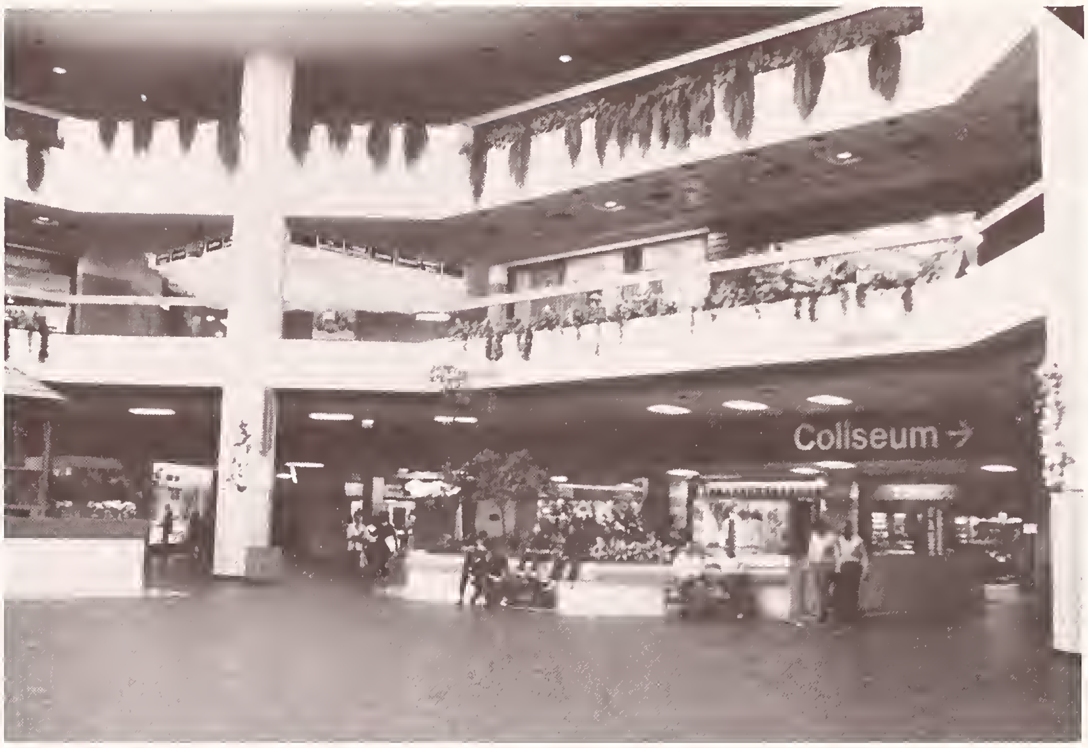


FIGURE 1 - 2
REUNION ARENA, DALLAS - CONCOURSE

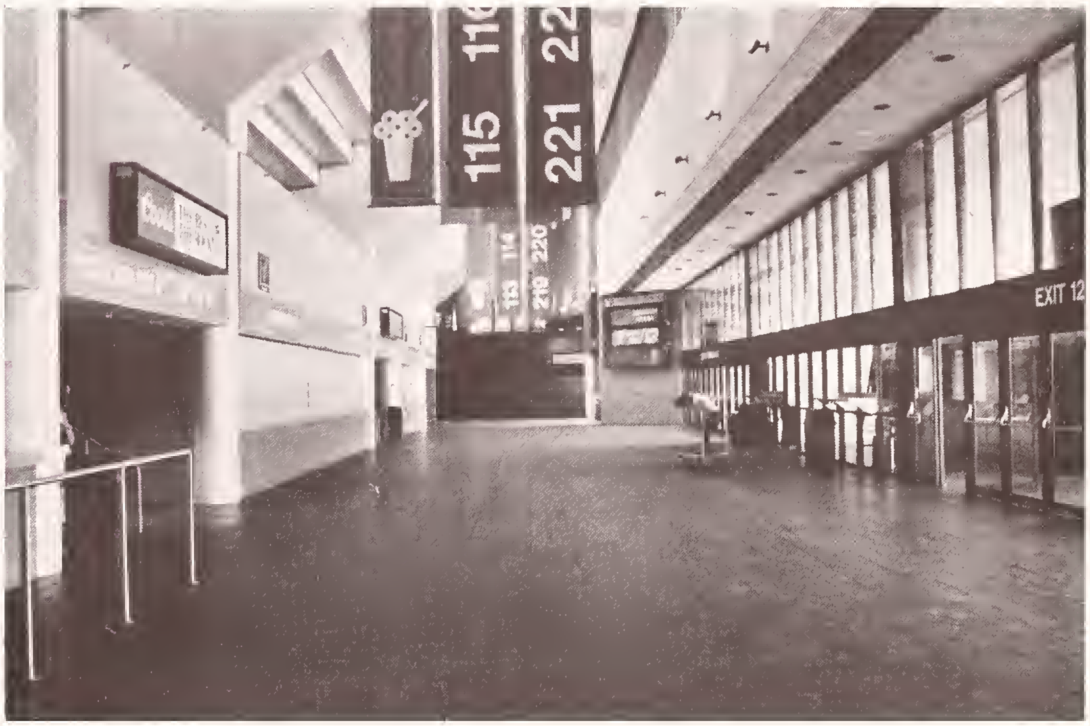

115 116
221 22
EXIT 12

FIGURE 1 - 3
BYRNE ARENA, MEADOWLANDS - CONCOURSE

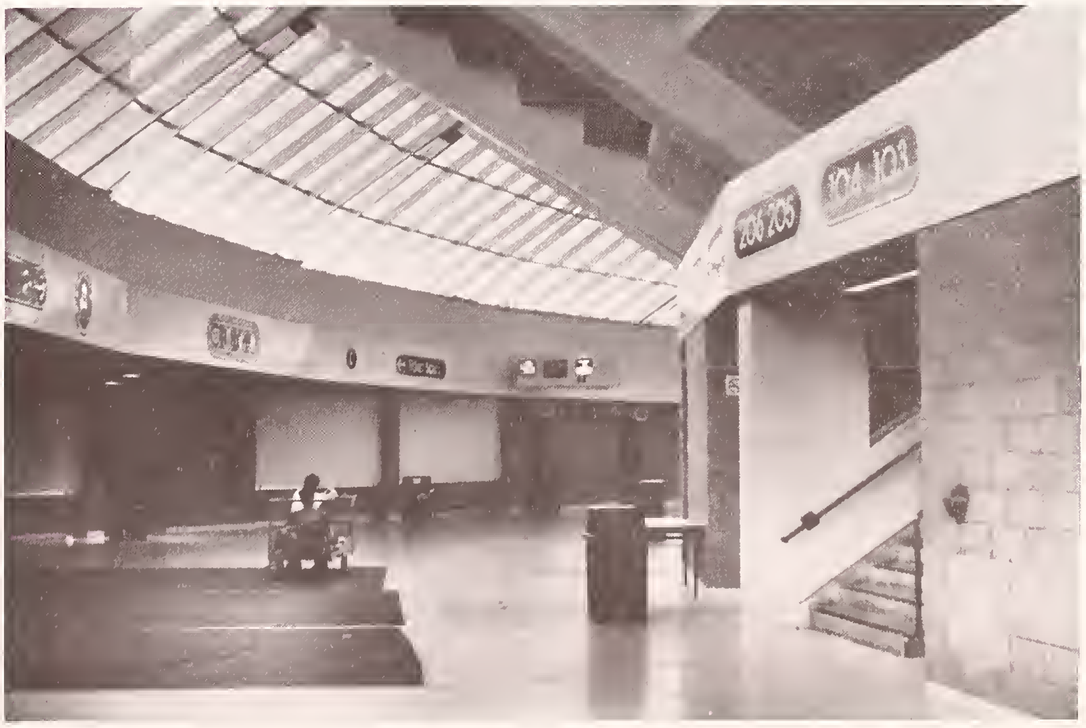

206 205
104 103

FIGURE 1 - 4
THE CENTRUM,
WORCESTER - CONCOURSE

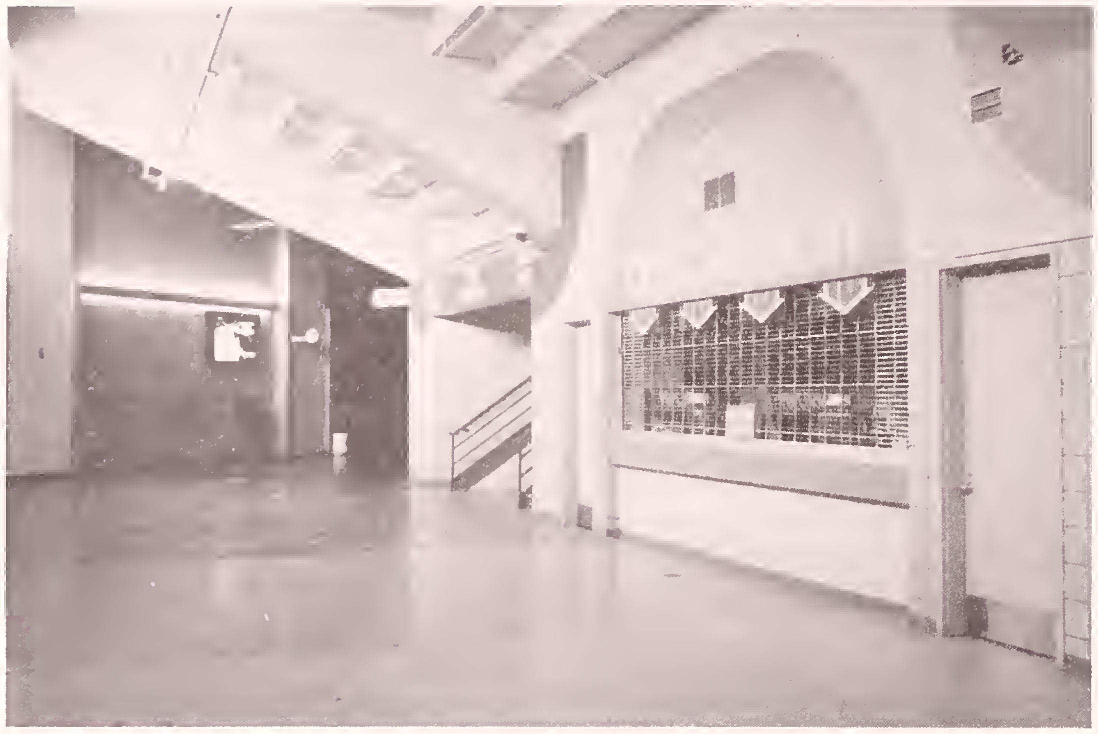


FIGURE 1 - 5
PROVIDENCE
CIVIC CENTER - LOBBY

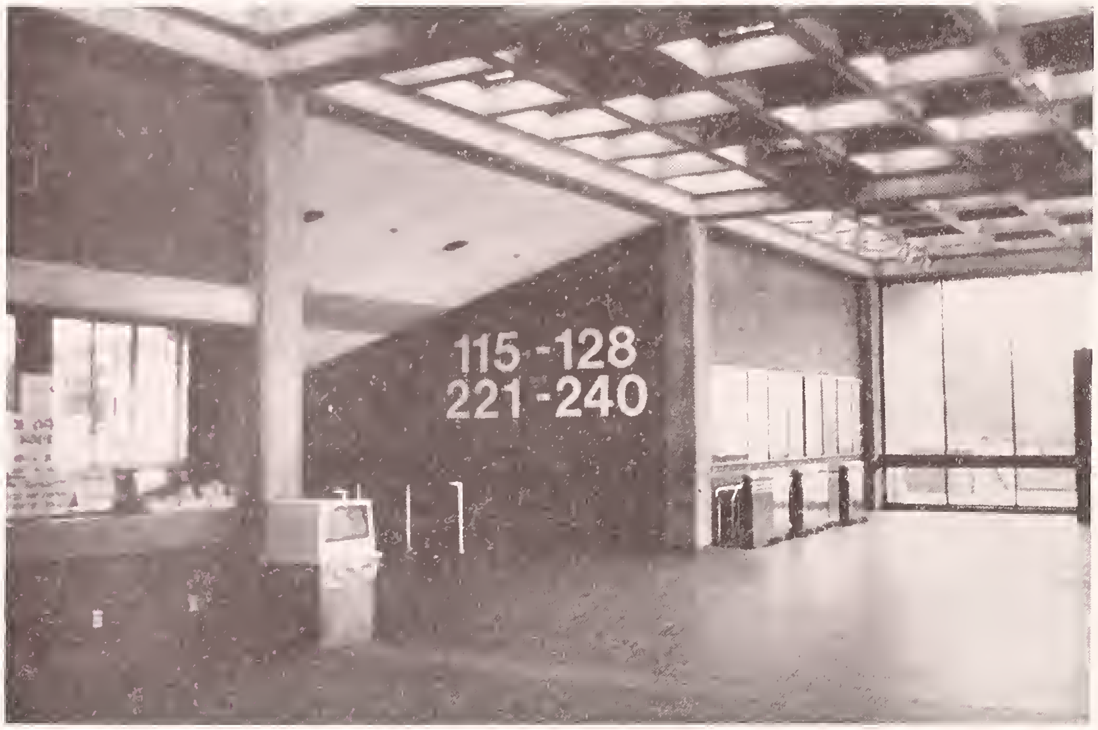


FIGURE 1 - 6
MONTREAL FORUM -
CONCOURSE

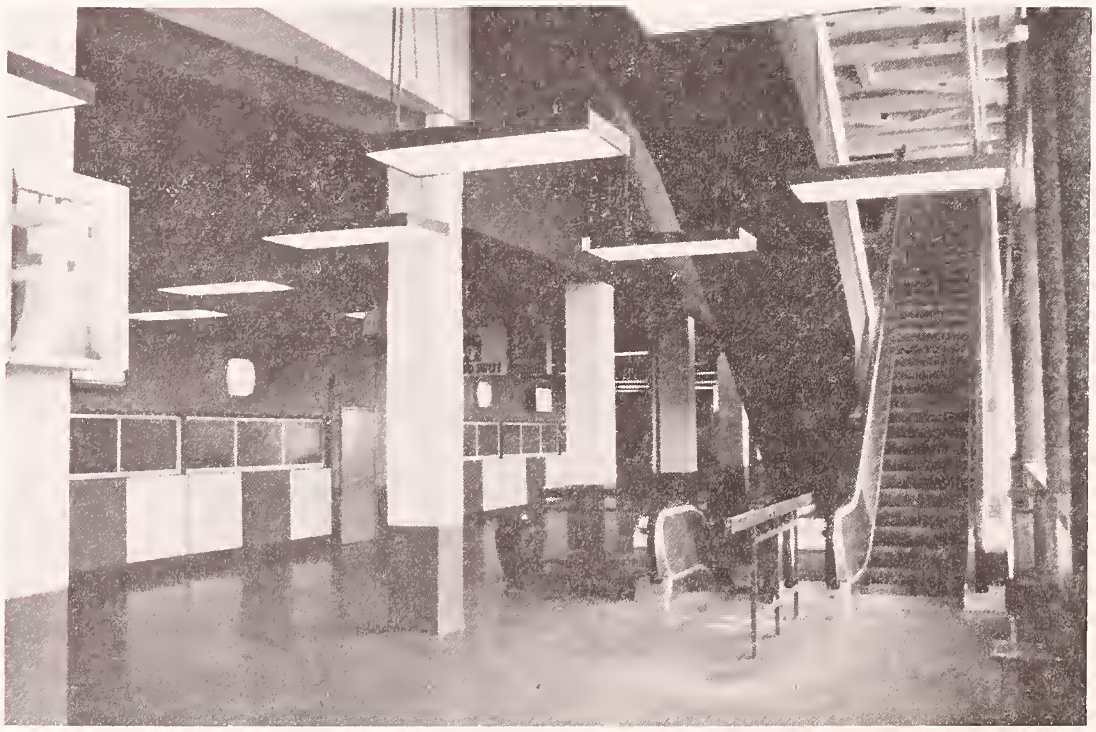


FIGURE 1 - 7
THE SPECTRUM,
PHILADELPHIA - ARENA

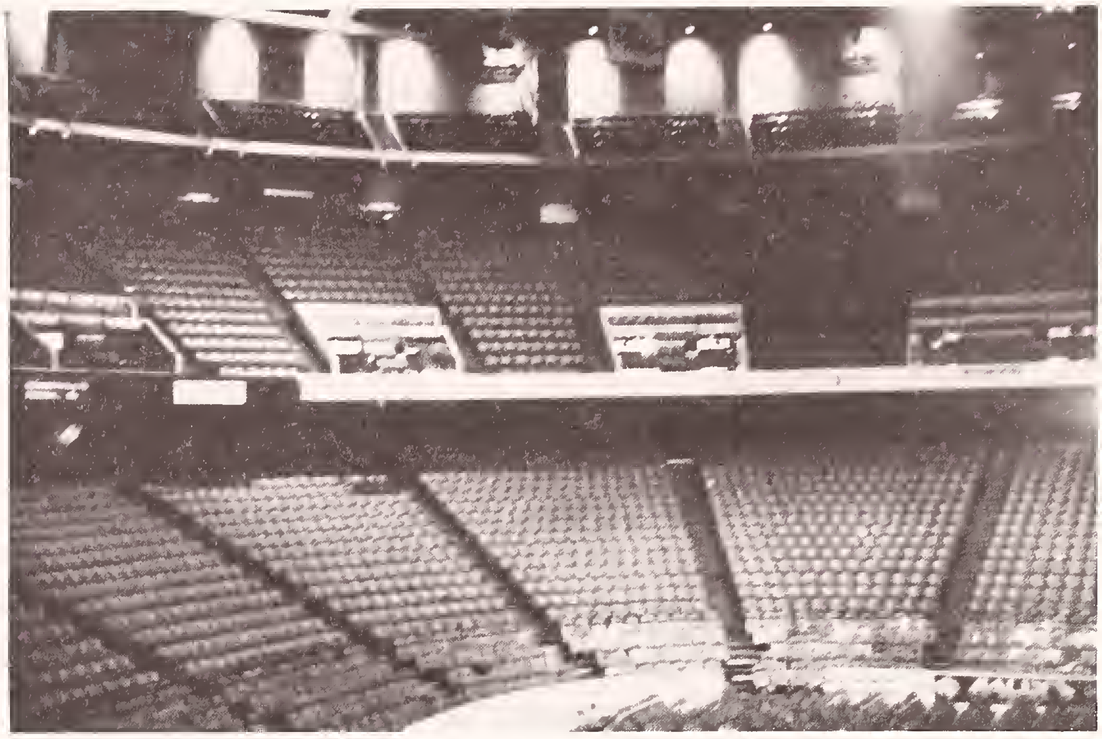


FIGURE 1 - 8
KEMPER ARENA,
KANSAS CITY - ARENA

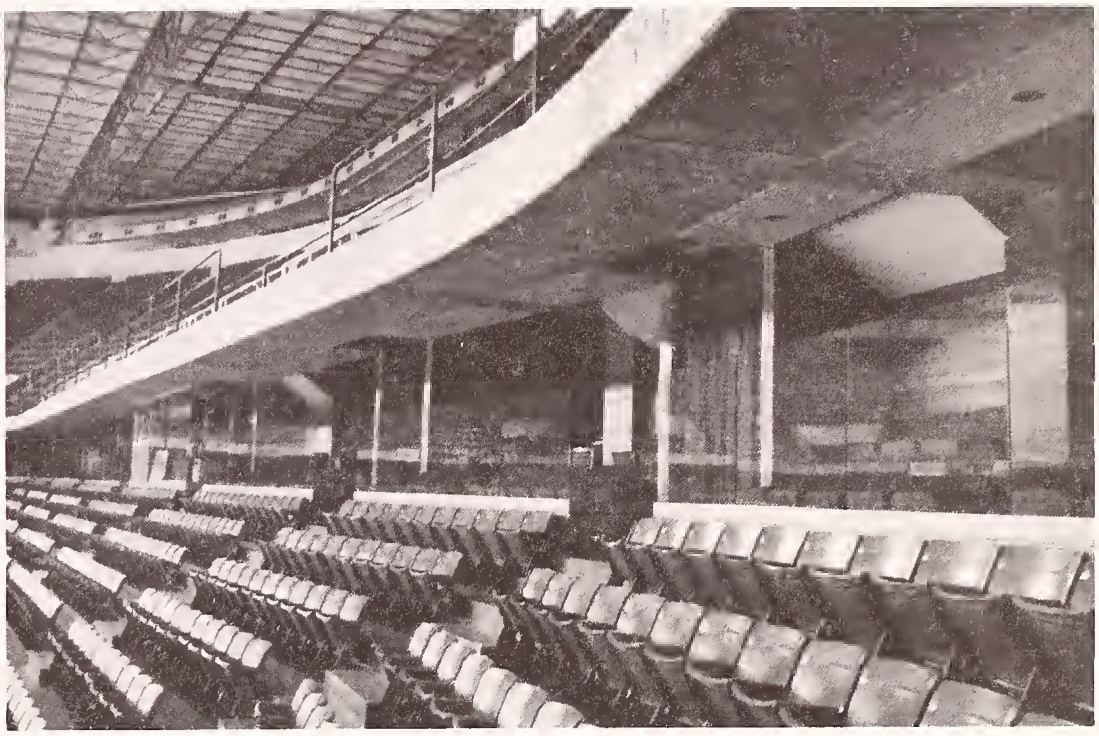


FIGURE 1 - 9
BYRNE ARENA,
MEADOWLANDS - ARENA

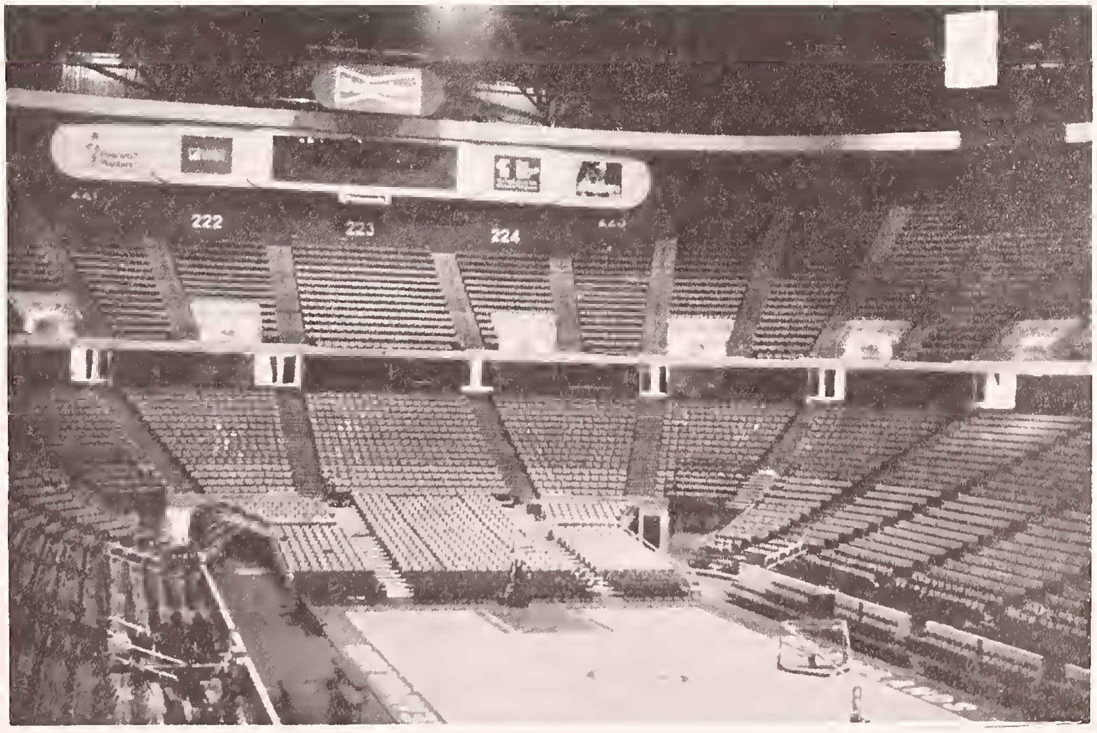


FIGURE 1 - 10
THE SPECTRUM, PHILADELPHIA - BOX OFFICE

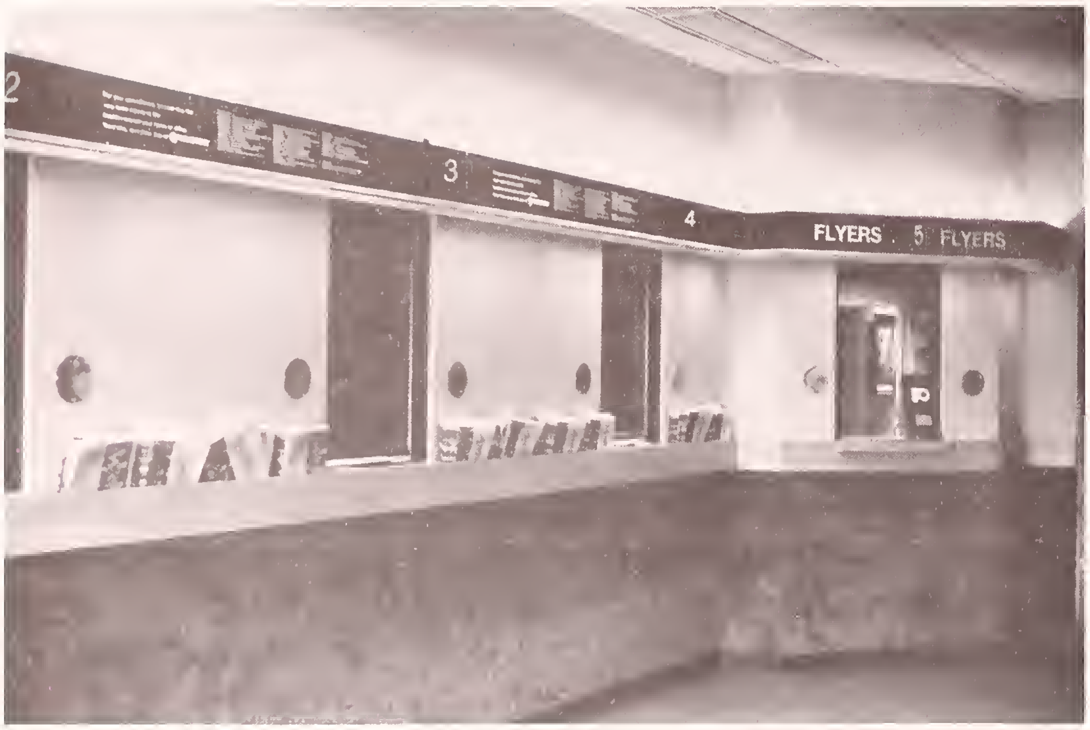

2
3
4
FLYERS
5
FLYERS

FIGURE 1 - 11
MONTREAL FORUM - TELEVISION STUDIO

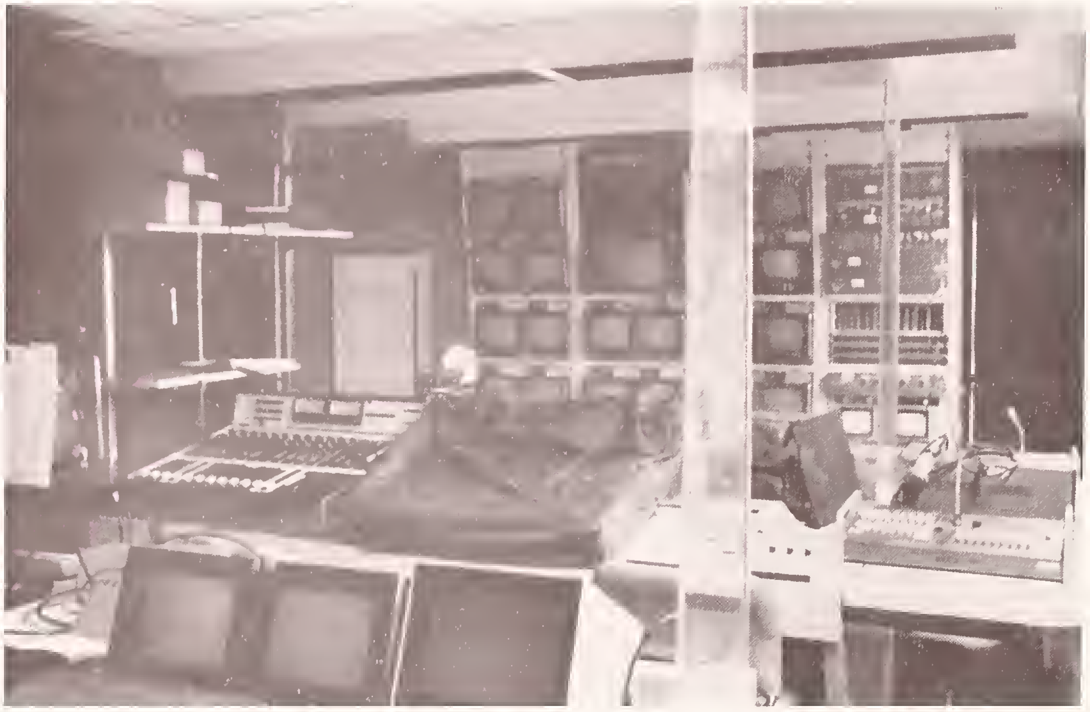
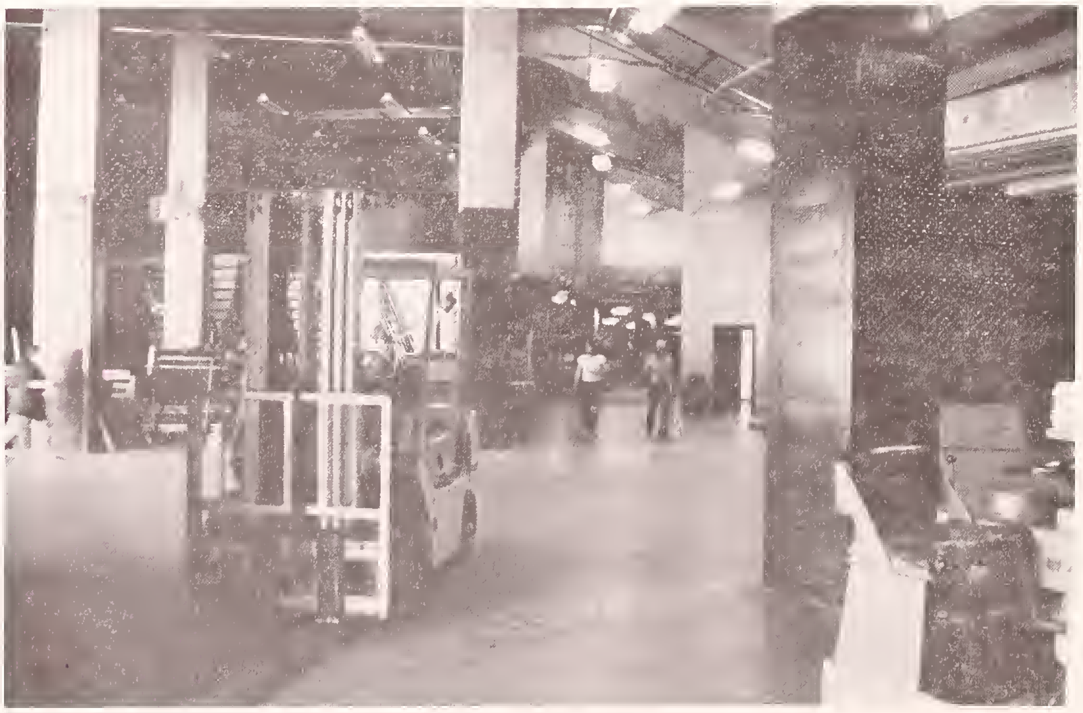


FIGURE 1 - 12
REUNION ARENA, DALLAS - SERVICE AREA



MARKET POTENTIAL

2

·GARDEN·ARENA·

'36

SPORT NEWS

'37

HOCKEY
BOXING
WRESTLING

10¢

TRACK
& OTHER
INDOOR EVENTS

MARKET POTENTIAL

2

Summary of Work Performed

The determination of Boston's market potential for large, public entertainment events involved the following major sub-tasks:

- Collection and analysis of population, demographic, and socio-economic data on the Boston marketplace
- Development of an historical profile of existing competing facilities in the Boston area
- Comparisons of the Boston entertainment market to other relevant facilities/cities through information obtained in the Industry Survey work
- Development of estimates for the number and type of events and attendance levels that may be expected for a multi-purpose arena in Boston

Characteristics of the Metropolitan Boston Area

The Boston metropolitan area is one of the largest in the United States. It has a population of well over three million people in the U.S. Census Standard Metropolitan Statistical Area. Boston's Metropolitan Market Ranking is currently sixth and projected to remain at that position through 1987, according to Sales and Marketing Management Magazine's "1982 Survey of Buying Power" (published July, 1983), a recognized, authoritative source for marketing information and data. The Arbitron Area of Dominant Influence (ADI) ranking for Boston is fifth nationally (see Exhibit 2-1).

In addition to the permanent population residing in the Boston area, there are many large colleges and universities with a total student population exceeding 300,000. Also, visitors to the city, either for vacations or conventions, exceed five million annually, according to the Boston Convention and Tourist Bureau.

Mass transit access is very good for a large percent of the population via trolley, subway, commuter rail, and buses. Boston is considered a mass transit-oriented city due to the sometimes difficult and complicated urban automobile access system and the long history of mass transit availability. 44 of the 107 cities and towns in a 30-mile radius around Boston are serviced by either a trolley, rapid transit, or commuter rail line (see Exhibit 2-2).
Exhibit 2-3 shows the heavy daily transit rider usage at North and South Stations. In addition, many bus routes connect to the rail system or directly to the downtown area.

Competitive Facilities

There are six arenas in southeastern New England with 10,000 or more seats. They are:

- Boston Garden,
- Worcester Centrum,
- Providence Civic Center,
- Springfield Civic Center,
- Hartford Civic Center, and
- New Haven Coliseum.

Exhibit 2-4 shows the size, population, number of professional sports tenants, and event mix for each of these facilities.

Arenas compete in two ways: (1) for tenants or events which rent the facility and, (2) for patrons to attend those events. Of the six facilities in southeastern New England, the Worcester Centrum and Providence Civic Center might compete most directly with the Boston Garden in both of these categories. This is primarily due to their proximity and accessibility to the Boston area (see Exhibit 2-5).

One of the primary factors affecting competitive position is the size of the market population which is readily accessible to a particular arena. Boston is clearly the largest of these three market areas. The population within its 30-mile non-overlapping boundary area is over 200 percent larger than Providence and 380 percent larger than Worcester (see Exhibits 2-5 and 2-6). The 20-mile non-overlapping boundaries yield even greater disparities. This analysis indicates that a much larger population has better access to Boston, compared to the other two facilities.

Further support for the concept that facilities draw primarily from their 30-mile boundaries comes from a sample of Centrum ticket sales contained in Exhibit 2-7 and Celtics season ticket holders contained in Exhibit 2-8. Sixty-eight percent of the Centrum ticket sales in the sample came from within a 30-mile radius of the Centrum, and 88 percent of the Celtic's season ticket holders have mailing addresses within the Boston 30-mile radius.

Secondary competition comes from the other facilities in the Boston area (see Exhibit 2-9). The largest of these facilities is the 6,300-seat Mathews Arena, located at and operated by Northeastern University. These facilities would offer little competition to a large, multipurpose arena, since their much smaller size limits them to the types of events that are financially viable with small audiences.

Industry Comparisons

The Boston Garden is one of only seven facilities which have both NBA and NHL tenants (see Exhibit 1-3). While Boston is the smallest metropolitan area to support two such franchises, local fan support is very strong, due to the historical success that the Celtics and Bruins have enjoyed. The Celtic's regular season average attendance was third in the league in 1983-84 and first in the league in 1982-83 (see Exhibit 1-16). The regular season average attendance for the Bruins was close to the league average during the same two seasons (see Exhibit 1-17).

Exhibit 1-3 also shows that the other two-team facilities have considerably higher numbers of events, compared to Boston. The Boston Garden had the fewest number of events: 198 events in 1983, compared to a range of 225 to 480 per year in the other six facilities. Seating capacities in all of the other two-team facilities are 20 to 30 percent greater than the Garden.

There are precedents for event levels in Boston comparable to the other six NBA/NHL facilities. 222 events were held in Boston Garden in 1981 and 227 in 1979. However, in recent years, the number of Garden events has decreased to approximately 200, below the level expected for major markets (see Exhibit 2-10).

There are some additional aspects unique to the Boston marketplace which favor high event utilization of a multi-purpose arena:

o Boston has a very large student population in addition to its resident population.

o Boston is considered to be a very desirable city for vacations, tourism and conventions.

o The Boston market is currently served by the oldest facility in the U.S. Entertainment demand at a new, larger, air conditioned facility would likely be higher than historical levels. This is due, in part, to additional prime summer dates being possible in an air conditioned facility.

Interviews with local college representatives, concert promoters, and family event sponsors indicated that there was a potential for increased use if the "right facility" were available and affordable. For example, concert utilization could be significantly increased with a new, larger facility.

An additional potential demand factor is space for meetings as a supplement to large conventions. Local convention planners indicated that several large conventions which require a large single meeting facility have chosen not to come to Boston due to the lack of an appropriately-sized and attractive facility.

Seating Capacity Recommendation

The appropriate size for a facility in the Boston marketplace should be in the range of 17,000 permanent seats. There is support for a facility size within this range:

- The long-term view of sports team management favors minimizing the number of empty arena seats. The Study Team understands that this may have a positive effect on long-term market demand for ticket sales and is a factor which should be considered in the final determination of the facility's seating capacity. The Study Team also believes that the Celtics may have the potential for average attendance levels higher than that presently achieved in the Boston Garden. According to the NBA attendance statistics, the Celtics' attendance levels ranged between 97 and 100 percent of Boston Garden capacity for the last two seasons. In the 1983-84 season, the Celtics' average capacity utilization was second only to the Portland Trailblazers which were at 100 percent utilization during the same season.

- A portion of the entertainment market, particularly concerts, can support a large facility. The economics of those events are such that the profit potential from sell-outs in larger buildings is much greater than that for smaller arenas. This is due to the high fixed costs of such events.

- Boston's market stature makes it a strong candidate for large "national" events if a suitable facility existed. A larger facility would open up the market for new events such as the NCAA basketball "final four", nationally televised sports spectaculars, "big-name" concerts, and world-class figure skating competitions.

The seating capacity used as a basis for estimating event and attendance levels is based on the following: Basketball capacity is assumed to be 17,300 seats. As explained in later chapters of this report, this capacity level was found by the Study Team to be the maximum seating possible, given the constraints of the North Station site. Most concerts and large meetings would also use this capacity. Hockey is assumed to be 16,580 seats. The circus also uses the hockey seating configuration. Ice show capacity is reduced to 12,700 due to the large sets that are used in these productions. Most other event types fall into one of these seating capacity categories.

A facility of this size would be well suited to the event mix that a new arena could support. Some events might be able to sell more tickets than the assumed maximum seating capacity of 17,300, but this capacity should be adequate for the majority of events.

Potential Event and Attendance Estimates

Boston's strong market position indicates that a high number of events and attendance could be sustained. This is especially true with a new or renovated facility. The expected range of events and attendance is presented in Exhibit 2-11. As explained above, a 17,300 seat maximum configuration has been assumed for purposes of this analysis.

The low end of the range shown in Exhibit 2-11, 185 events and 2,130,000 attendees, is currently taking place at the Garden. The projection is further divided into two major categories, "Baseline" and "Additional Potential". The Boston market can be expected to easily support an amount in the middle of the total event range, or 240 events and 2,811,000 attendees per year (see Exhibit 2-12).

The "Baseline" number of events and attendance by event type is as follows:

- Celtics Basketball: It is assumed that the current levels of one pre-season and 38 regular season home games would be played. In addition, it is assumed that six home playoff games would also be played on average, which is consistent with the Celtics' historical average. For the 1982-83 and 1983-84 regular seasons, the Celtics reported 15,167 and 14,801 average attendance per game, respectively (see Exhibit 1-16). The attendance figures represent 99 percent and 97 percent of the Garden's official basketball seating capacity, according to the capacity of 15,320 as reported by the NBA Guide. For purposes of estimating the market potential it is assumed that the Celtics' regular season attendance would run approximately 95% of capacity, even for an arena somewhat larger than the Garden. It is assumed that post-season games would be sell outs.

- Bruins Hockey: The Boston Bruins, like the Celtics, also have a winning tradition. They have played an average of approximately six home post-season games over the past five years. Pre-season games are not played at the Garden and regular season games are 40 per year. It is assumed that these historical averages will continue and the Bruins will play 40 regular and 6 post-season games. Average attendance for the Bruins, as cited in Hockey News magazine, showed that the Bruins average regular season attendance was between 83 and 94 percent of Boston Garden capacity for the past three seasons. It is assumed for projection purposes that the Bruins will average 80 percent regular season and 100 percent post season attendance in a new larger arena.

- Family Shows: There are three events that have been included in this category:
  - Ringling Brothers and Barnum and Baily Circus. The Circus has been holding between 20 and 25 events at the Garden for a number of years. Average attendance in 1983 was 6700 per event.
  - Disney on Ice. This is one of the two ice shows that play the Garden each year. Disney plays between 20 and 25 events with a 1983 average attendance of 8000 per event.
  - Ice Capades. The Ice Capades is the second ice show that holds events at the Garden. Between 8 and 12 events are held annually, with average attendance of 65 to 70 percent of the 11,146 ice show capacity.

  The producers of these events have indicated that significant increases in both events and attendance could be realized in a new arena in Boston. Based on their estimates the family show total is assumed to be 72, which include 30 circus, 30 Disney on Ice, and 12 Ice Capades performances. Average attendance is assumed to be similar on a percentage basis to the historical averages.

- Concerts: There is no definitive, consolidated, industry database which compiles information on the number of concerts held nationwide on an annual basis. During the late 1970's and early 1980's, it is believed the number of concerts held nationally dropped off due to adverse economic conditions. Decreases in record sales support this observation. In fact, all forms of entertainment spending suffered during the recession. There has been a recent resurgence of both concerts and record sales which can be attributed to a number of reasons, including:

- The "live" entertainment experience has been greatly enhanced by technical innovations in video, lighting, pyrotechnics, and sound/audio techniques.

- Some industry professionals assert that music videos and MTV have and will continue to have a positive impact on the concert market due to the increased emphasis on the visual part of the music experience. This could lead to fans' increased desire to participate in the "live" experience of a concert.

- Record producers and related companies have become more sophisticated in the marketing of the overall music product, including the relationship of concerts to record sales.

The number of concert events at the Garden has decreased significantly in recent years from a high of 29 in 1981 to a low of 2 in 1983. This is one of the primary event types that will be assumed to increase significantly with a new arena. Numerous interviews with industry professionals, including promoters and arena managers, supported the position that Boston is potentially one of the best concert markets in the country. Other major market facilities hold between 25 and 50 concerts per year. Even secondary market-facilities such as Providence and Worcester hold between 20 and 70 concert events annually. Through the interviews conducted by the Study Team, it was determined that a level between 30 and 55 could be supported in the Boston entertainment market. The "base-line" assumption is that 35 concerts would be held in a new arena. Industry standards and interviews indicated that concerts could have a very high average attendance rate, ranging between 80 and 100 percent of the arena's capacity. Capacity in the new arena is estimated to be 17,300 for end-stage concerts where the seats behind the stage are not sold. Some concerts could be set up in a center stage arrangement, allowing seating on all sides of the stage. This could increase the maximum concert seating capacity to approximately 18,200, including portable floor seating. The average capacity per concert is assumed to be 17,800. Approximately half of these concerts can be expected to sell out and the other half will be 75 percent sold. This yields an assumed concert capacity utilization of approximately 88 percent, on average.

- College and High School Sports - Boston has a large student population. The 6,300-seat Mathews arena at Northeastern University is the largest local school facility. Interviews with the athletic directors of three of the largest colleges indicated that they would like to use a larger arena on a more frequent basis. Historically, the Garden has accommodated as many as 20 college and high school events per year. Recently, this number has decreased to eight for fiscal year 1984. Given the expressed desire of the colleges to utilize a larger facility and the historical levels of college utilization of the Garden, it is assumed that 15 college events will be held in a new arena.

  High school sports generally include state basketball and hockey championships. These have numbered between two and four events historically at the Garden. It is assumed that three high school sporting events will be held at the new arena.

  Average attendance for college and high school sports varies widely depending on the particular event. The low end of the range would be the high school events and the high end would be the "Bean Pot" hockey tournament which matches four Boston area colleges against each other. The overall capacity utilization for college and high school sports is low compared to other types of events and is assumed to be approximately 40 percent of total seating capacity.

- Other Events - All other events, exclusive of those discussed above, that could be held at the arena, fall into this category. They include, among others:

  - professional wrestling
  - boxing (including closed circuit TV)
  - other family shows (e.g., Harlem Globetrotters)
  - world figure skating events
  - religious gatherings
  - convention-related uses
  - high school and college graduations
  - classical concerts (e.g., Luciano Pavarotti)
  - tennis tournaments
  - amateur track meets (not requiring a 200 meter track)

- State or local political meetings
- operas
- trade and art shows
- union meetings
- one-time semi-professional sports events (like Olympics on Ice or gymnastics)
- additional concerts
- vehicle competitions

Historically, the numbers of these types of events has ranged between 19 and 24 per year at the Garden. It is assumed that these events will continue at the upper end of this range at 24 events per year. Attendance at these events varies widely, similarly to college and high school sports. Based on industry statistics and interviews with arena managers, the assumed attendance level for other events is 46 percent of capacity, on average.

Conclusion

A new arena in Boston should be expected to sustain approximately 240 events per year, with total annual attendance of approximately 2,800,000 patrons. The mix of events, based either on market demand or community interest, would include a wide diversity of entertainment in addition to the traditional mix of professional sports, concerts, circus, ice, and other family events commonly found in arenas serving major markets.

FACILITY PROGRAM

3

BEER
22

FACILITY PROGRAM

3

Summary of Work Performed

Based on the analysis of the Boston marketplace and contemporary standards for arena design, a building program was developed during Phase I of the study by the Study Team. This program assisted in the analysis of the Boston Garden, and was used to identify a basic arena "footprint" for use in analyzing alternative new arena sites. Once the basic dimensions of the arena building were determined, the arena building footprint was used to compare the dimensional characteristics of alternative new arena sites.

A specific program for a multi-purpose arena was developed on the basis of maximizing the number of seats which could be accommodated in a new facility built at North Station between the existing Boston Garden and the expressway ramps. This constraint was identified as a critical one early in the site analysis process so that the program could be used to help analyze the most constrained site; the choice of North Station for testing of program size in no way represented a prejudgement of the feasibility of that site. Computer-aided design (CADD) was used to assist in precisely evaluating the seating capacity of specifically dimensioned sites (Exhibit 3-1).

Seating Capacity

The analysis of the marketplace potential indicates that an arena of 18,000 seats (or somewhat more) would be appropriate for the region. Subsequent analysis of the North Station site indicated that a 17,311 seat facility could be designed for the site. The Study Team concluded that this size was sufficiently close to the preferred arena size. The figures below represent seat counts based on the preliminary schematic design concept for a new arena presented in Chapter 7 of this report. The program currently being recommended by the Study Team has 16,853 permanent seats for hockey, and with additional moveable seats, 17,311 for basketball. As many as 18,151 seats would be available for boxing or center stage concerts. During final design of the arena, it is necessary that the actual seating count be even further refined with input from the Bruins, Celtics, other major teams and the final designer.

Seating would be distributed in the building as follows:

Lower Level	
Permanent	6,428
Retractable/Flexible	336
Suites @ Concourse	432
Handicapped	60
Floor-moveable	1,259
Upper Level	
Permanent	9,636
Total Seating Capacity	18,151

Seating Organization

There are five (5) main seating areas:

Concourse Level Seating - Seating in this area has been planned with seats (self-rising) at 20" on center with cast frame and arms. Seat back and seat would be molded plastic. Dimensions of seating tiers are anticipated at 32" treads and 15" risers. 21 rows of fixed seats are recommended for this level. Aisles would each be 5'-0" wide.

Retractable Seating - For purposes of determining the seat count for retractable seating, the same dimensional critiera as the concourse level seating was assumed.

Concourse Level Private Suites (27) - These suites, each with 300-325 S.F., would completely encircle the arena at the concourse with an option that in some cases the suites can be joined together. 10-12 movable seats are recommended for use in each typical suite. There are two seating rows of eight fixed seats each within each suite to provide maximum viewing potential.

Upper Level (Balcony) Seats - Recommended seating in this area is self-rising seats at 20" O.C. with cast frame and arms. Seat back and seat would be molded plastic. Seating tiers would be 31" treads and 20" risers. 20 rows of fixed seats are planned for this level. Aisles are recommended to be 5'-0" wide. Vomitories (with two 5'-0" wide stairs each) would occur every other section.

Building Dimensions

Based on the program and the North Station site constraints, basic building dimensions were developed in order to evaluate the alternative new building sites. Outside roof dimensions are 408'-0" x 293'-6". Maximum distance of remote seat from center of arena is 145 feet along the short axis and approximately 200 feet along the long axis. This arena configuration offers a substantial percentage of seats close to the playing floor as well as the most efficient relationship between height of seating tier and height of structure required.

Services

Public services (concessions, toilets, circulation, first aid, etc.) would be directly accessible from a single main concourse level.

Support

Arena support areas (locker rooms, press rooms, kitchens, maintenance facilities, storage and staging, etc.) are planned for the arena floor level. Service access would also occur at this level with direct high-level dock access available for trucks.

Floor

Hockey - built to NHL guidelines: 200' x 0" x 85'-0" between dasher boards with 15'-0" radius corners.

Basketball - built to NBA guidelines: 50'-0" x 94'-0" with 10'-0" zone around perimeter of court.

Indoor Soccer - built to MISL guidelines: 200'-0" z 85'-0" between dasher boards with 15'-0" radius corners.

Multi-purpose Arena Program Summary

A) Arena Activity Areas	17,500 S.F.
B) Seating	100,124 S.F.
C) Spectator Amenities	16,530 S.F.
D) Concourse and Vertical Circulation	115,460 S.F.
E) Concessions	8,680 S.F.
F) Box Office	5,290 S.F.
G) Media Systems	2,480 S.F.
H) Administrative Offices	6,270 S.F.
I) Security	1,080 S.F.
J) Press and Media Facilities	4,700 S.F.
K) Major Tenant Offices	6,700 S.F.
L) Locker and Dressing Rooms	11,450 S.F.
M) Concession Support Areas	9,700 S.F.
N) Staff Support Areas	1,400 S.F.
O) Building Maintenance Areas	3,150 S.F.
P) Storage and Service Areas	52,700 S.F.
Q) Ice Facilities	2,500 S.F.
R) Building Systems	15,000 S.F.
TOTAL GROSS AREA	364,990 S.F.

A comparison of this new building program to the distribution of spaces within the existing Boston Garden is shown in Exhibits 3-2 and 3-3. The comparison shows that a new building would contain somewhat more space per spectator than does the Garden. The new building program will result in a building with 21.1 gross sq. ft. per seat, whereas the Boston Garden has 20.5 gross sq. ft. per seat.

Program

A) Arena Activity Areas — 17,500 S.F.

Basketball Court	50' x 94' (w/10' perimeter)
Hockey Rink	85' x 200'
Soccer	85' x 200'

B) Seating — 100,124 S.F.

Upper Level	56,150 S.F.
Lower Level	36,658 S.F.

Basketball	17,311 seats
Hockey	16,588 seats
Concerts (Center Stage)	18,151 seats
Boxing	18,151 seats
Conventions	18,151 seats

Suite Seating
27 Suites @ 308 S.F. Ea. — 8,316 S.F.
16 Fixed Seats/Suite
Wet Bar w/Sink
Refrigerator

Cost Closet
Liquor Storage
T.V. Monitor
Toilet (Includes W.C. and Lavatory)

C) Spectator Amenities 16,530 S.F.

Public Restaurant (250 People @ 15 S.F./Person)	3,750 S.F.
Arena Club (234 People @ 15 S.F./Person)	3,500 S.F.
Bar (480 People @ 5 S.F./Person)	2,400 S.F.
Toilets/Service	2,920 S.F.
Shared Kitchen	2,640 S.F.
Storage	1,040 S.F.
Offices	280 S.F.

D) Concourse/Spectator Circulation 115,460 S.F.

Circulation	105,030 S.F.
Toilets - Men's: 4 @ 1,000 Ea. 2 @ 450 Ea.	4,900 S.F.
- Women: 4 @ 1,000 Ea. 2 @ 450 Ea.	4,900 S.F.
First Aid Room	480 S.F.
Spectator Information	150 S.F.

E) Concessions 8,680 S.F.

Service Centers	8,680 S.F.

Arena Mezzanine: 156 Lineal Ft. at Counter
Concourse Level: 220 Lineal Ft. at Counter

F) Box Office 5,290 S.F.

Ticket Sales (Advance)	400 S.F.
Ticket Sales (Event)	900 S.F.
Safe Room	50 S.F.
Group Sales	50 S.F.
Staff Offices	3,520 S.F.
Mens' Toilet	30 S.F.
Womens' Toilet	30 S.F.
Files/Storage	150 S.F.
Vault	100 S.F.

G) Media Systems 2,480 S.F.

Scoreboard & Sound Control Room	308 S.F.
PA System Sound Room	350 S.F.
Sound Equipment Room	822 S.F.
In House TV Control Room	1,000 S.F.

H) Administrative Offices	6,270 S.F.
Reception	200 S.F.
Manager's Office	200 S.F.
Conference Room	550 S.F.
Secretarial ARea	400 S.F.
Offices (12 @ 150 Ea.)	1,800 S.F.
Lobby/Circulation/Toilets	3,120 S.F.

I) Security	1,080 S.F.
Reception	150 S.F.
Control Room	150 S.F.
Manager's Office	100 S.F.
Locker Rooms (2 @ 290 S.F. Ea.)	580 S.F.
Retention Room	100 S.F.

J) Press and Media Facilities	4,550 S.F.
Press Box	500 S.F.
Press Lounge	400 S.F.
Bar	250 S.F.
Storage	300 S.F.
Toilets (2 @ 250 S.F. Ea.)	500 S.F.
Press Room	250 S.F.
Work Rooms (4 @ 75 Ea.)	300 S.F.
Radio Broadcast Room	250 S.F.
Radio Equipment Room	150 S.F.
Radio Storage	100 S.F.
T.V. Broadcast Room	800 S.F.
T.V. Mixing Room	400 S.F.
T.V. Interview Set	100 S.F.
T.F. Equipment Storage	250 S.F.

K) Major Tenant Offices	6,700 S.F.
Celtics	2,250 S.F.
Bruins	2,500 S.F.
Lobby/Circulation/Toilets	1,950 S.F.

L) Locker and Dressing Rooms	11,450 S.F.
Celtics - Total	2,575 S.F.
Dressing	700 S.F.
Showers	200 S.F.
Toilet	125 S.F.
Exercise Room	300 S.F.
Trainer's Office	100 S.F.
Training Room	200 S.F.
Medical Equipment Storage	150 S.F.
Whirlpool	50 S.F.
Sauna	175 S.F.
Equipment Storage	200 S.F.
Film Room	150 S.F.
Laundry	225 S.F.

Bruins - Total	2,575 S.F.
Dressing	700 S.F.
Showers	200 S.F.
Toilet	125 S.F.
Exercise Room	300 S.F.
Trainer's Office	100 S.F.
Training Room	200 S.F.
Medical Equipment Storage	150 S.F.
Whirlpool	50 S.F.
Sauna	175 S.F.
Equipment Storage	200 S.F.
Film Room	150 S.F.
Laundry	225 S.F.

Visting Team Locker Rooms 2 @ 1,150 S.F. Ea.	2,300 S.F.
Dressing Rooms 4 @ 750 S.F. Ea. 2 @ 500 S.F. Ea.	4,000 S.F.

M) Concession Support Areas	9,700 S.F.
Manager's Office	900 S.F.
Settlement Room/Vault	300 S.F.
Uniform Storage and Distribution	100 S.F.
Men's Locker Room/Toilets	400 S.F.
Women's Locker Room/Toilets	350 S.F.
Receiving Area	100 S.F.
Refrigerator	250 S.F.
Freezer	250 S.F.
Liquor Storage	1,000 S.F.
Dry Storage-Food	1,000 S.F.
Storage-Novelties	1,000 S.F.
Storage-Returnable Containers	500 S.F.
Storage-Portable Concessions Stands	1,000 S.F.
Suite Service Kitchen	1,200 S.F.
Trash and Garage Area	1,350 S.F.

N) Staff Support Area	1,400 S.F.
Men's Locker Room	300 S.F.
Men's Toilet and Shower	250 S.F.
Women's Locker Room	300 S.F.
Women's Toilet and Shower	250 S.F.
Lunch Room	300 S.F.

O) Building Maintenance	3,150 S.F.
Shop	1,000 S.F.
Storage	1,750 S.F.
Engineers Office 2 @ 100 S.F. Ea.	200 S.F.
Building Systems	150 S.F.

P) Storage and Service	52,700 S.F.
Basketball Floor and Goals	900 S.F.
Stage	900 S.F.
Floor Seating	900 S.F.
Hockey Goals	
General Storage	15,300 S.F.
Staging Areas	
Truck Parking - 5 Bays	6,500 S.F.
Service Dock	4,500 S.F.
Garbage & Trash Compactor (w/concession support)	
Vending, Telephone	1,000 S.F.
Miscellaneous	22,700 S.F.
Q) Ice Facilties	2,500 S.F.
Ice Plants	1,360 S.F.
Zamboni Parking (2) @ 250 Ea.	500 S.F.
Ice Melting Pit	640 S.F.
R) Building Systems	15,000 S.F.
Chilled Water Plant	1,700 S.F.
Electrical Transformer Rooms	5,500 S.F.
Telephone Equipment Rooms	500 S.F.
Mechanical Equipment Room	7,000 S.F.
Maintenance Personnel Locker & Toilets	300 S.F.

EVALUATION OF THE BOSTON GARDEN

4

EVALUATION OF THE BOSTON GARDEN

4

SUMMARY OF WORK PERFORMED

This portion of the project began with the preparation of a detailed data request to the Boston Garden management. This information request is reproduced in the Appendix. Information requested included financial, operational, patron-related statistics and physical facility information, including renovation plans. An initial facility tour was conducted by the Boston Garden management and its consulting architect, and several followup inspections were made by members of the Study Team. During the course of this work, Garden management participated in several interviews as follow-up and clarification to the written data request.

MARKET EVALUATION

The number of Boston Garden events by type was provided by the current management for fiscal years 1980 through May 1984. A summary of historical events by type is presented in Exhibit 2-10. Some of the data provided included double counting of events where two games were played but only one admission was collected (primarily college and high school sports). The event numbers were adjusted to reflect the number of events for which a ticket was purchased. Detailed attendance data by type of event was not provided by Garden management. Where possible, other sources were employed to obtain this information, such as the NBA, NHL, and event promoters.

In recent years the number of events held in the Boston Garden has decreased from a high of 222 in 1981 to a low of approximately 180 to 200 in 1984. The decline has been concentrated in concerts, college/high school sports, and family shows.

It is generally believed that this decline has been due to the opening of the Worcester Centrum. The Centrum is considered one of the Boston Garden's two primary competitors, as described in Chapter 2 of this report. The Centrum held 69 concerts in its first 10 months of operation ending June, 1983. However, Exhibit 2-7 shows that the Centrum did not draw a significant number of patrons from the Boston area marketplace. Thus, the effect of Centrum competition appears to be more an issue of competition for events rather than a lack of Boston area patron demand for concerts.

Comparing the number of events currently being held at the Garden to the market potential of 240 annual events, as previously determined, the Garden is estimated to fall short of its market potential by 40 to 60 events per year.

Total annual attendance at the Garden has been steady at slightly more than 2 million attendees. The average attendance per event is approximately 10,800. The total attendance and attendance per event are within the upper range of industry averages. Much of this can be attributed to the long-standing success enjoyed by the major sports tenants. As previously stated, the Celtics had a three-to-five-year waiting list for season ticket applicants, even before winning the 1984 World Championship. These statistics indicate that there may be an unmet demand for tickets to certain events held at the Garden.

The mix of events offered by the Garden is narrower than that commonly found for similar facilities in other major cities. Exhibit 1-20 shows a sample of events other than franchised sports offered by facilities around the country and also shows that a minority of these events have recently been offered by the Garden. One of the reasons for the Garden's rather narrow event mix is the lack of prime available dates. Exhibit 4-1 illustrates an event season calendar for the Boston Garden during 1981 (one of the recent years showing high event statistics). It shows that the warm weather season (April through September) is very lightly booked. This season is typically used for concerts and other family/community events. With air conditioning, the Garden could enhance both the number and mix of entertainment events offered.

Exhibit 4-2 shows the number of events from May through September that are held at selected arenas serving both major and minor markets. The Garden has achieved event utilization during the warm weather that is, at best, equal to the minor market facilities. In recent years the Garden's summer event statistics have fallen even below those levels. A major market facility can be expected to hold between 40 and 60 events during the May through September season.

FINANCIAL EVALUATION

Internal and External Contractual Arrangements

The Boston Garden facility is owned and operated by the New Boston Garden Corporation, the President of which is Mr. Paul A. Mooney. This corporation is wholly owned, through a subsidiary relationship, by the Delaware North Companies, Inc. Other related entities involved in the Garden operation or the resident professional hockey team are:

- The Garden Service Corporation, which operates the concession business at the Garden.
- The Boston Professional Hockey Association, Inc.
- The American Hockey League Club of Boston, Inc.

The President of all three above-named companies is Mr. Paul A. Mooney, according to the most recent Commonwealth of Massachusetts Annual Reports of Condition on file at the Massachusetts Secretary of State's office.

The directors of these various companies are identical, as reported in the Annual Reports of Condition. The Boston Professional Hockey Association, Inc. is the owner of the Boston Bruins hockey team.

There are various contractual relationships among or between these related corporations, the exact nature of which Mr. Mooney felt was proprietary and would not disclose. To complete the analyses of the Garden's financial performance, estimates were made concerning the nature of intercompany relationships that might exist at the Garden. Further discussion of the financial impact of conventional "arms-length" relationships, as compared to the Garden's current contractual relationships, is contained in later sections of this chapter.

The New Boston Garden Corp. has contracts with 14 labor unions that include the majority of the non-management staff at the Garden. The exact nature of these contracts is not known, but it is believed by the Study Team and others in the industry that the labor-related costs at the Garden are greater than the majority of arena facilities contacted in the Industry Standards analysis.

The New Boston Garden Corporation also contracts with various tenants, including the Boston Bruins, Boston Celtics, Ice Capades, Irving and Kenneth Feld Promotions, Inc. (Ringling Bros. and Disney on Ice), and various other renters of the facility. The Celtics have a multi-year rental agreement. Most other rental contracts are negotiated on an annual or per-event basis.

Current Financial Results

A detailed data request was prepared by the Study Team and submitted to Garden management at the beginning of the project; requests for specific financial information were included. This data request is reproduced in an Appendix to this report. Much of the requested data was prepared and submitted to the Study Team by Garden management in a timely manner. Some items were not submitted in writing, but were discussed with management. Other requested information was considered proprietary by management and therefore no response was obtained. Unavailable data included:

- copies or explanations of certain contractual agreements;
- gross ticket sales and attendance data by type of event;
- detailed financial data relating to revenues (including concessions) and expenses by type of event;
- balance sheet financial data including detailed accounting for property, plant, and equipment investments;

- the financial terms for rental agreements with major tenants.

Additionally, other requested data which was not supplied included a breakdown of the Garden management's estimated total renovation cost by project component.

Historical Boston Garden income statements as reported by management are presented in Exhibit 4-3. According to these statements, the Garden has achieved full year net income levels (assumed to be before income taxes) that range from a $535,555 loss for 1979 to a $337,369 profit for 1983. It is important to note that these statements represent the operating results of the New Boston Garden Corp. only. The statements do not reflect any profits from the concession business or the Bruins hockey team organization, if any.

A comparison of operating income levels for the Garden and eight other facilities from around the country is presented in Industry Overview Exhibit 1-21. Operating income is defined as income before depreciation, interest, real estate taxes, and income taxes where applicable or known. In 1983, the Garden results were near the average of the operating income levels reported for the eight other facilities.

Current Financial Results Restated for "Arms Length" Contractual Relationships

As mentioned earlier, the various corporations that participate in Garden operations are all direct or related subsidiaries of the Delaware North Companies, Inc. The potential for intercompany agreements may lead to less than "arms length" contractual relationships that would otherwise occur between unrelated parties. This may result in Garden financial statements that are difficult to compare with facilities that operate with "arms-length" agreements.

An attempt was made to estimate the effect of intercompany transactions on the 1983 operating results of the New Boston Garden Corp. and is shown in Exhibit 4-4. The result is a restated net income amount that is significantly higher than that reported by Garden management. The primary reason for the higher restated net income is that a portion of estimated gross concession revenues is included in the restated results, as well as a partial redistribution of concession revenues to the major sports tenants.

The income statement supplied by Garden management showed total concessions, advertising, and program revenues of $1,259,506 for 1983. It was estimated that advertising and program revenues accounted for approximately $450,000 of this amount, which is a reasonable amount based on industry standards. The remaining $839,000 represents an estimate for concession revenue paid to the Garden by the related concession subsidiary and included in the Garden's reported financial statements.

Considering a normal gross concession spending per person in the industry of approximately $3 per attendee, the gross concession sales for 1983 would have been approximately $6,450,000 for the Garden. The $839,000 estimate for Garden concession income represents 13 percent of the Garden's estimated gross concessions sales.

Normal industry agreements range between 35 and 40 percent of the concession gross revenue going to the building in primary markets where the building owner paid for concessions equipment and installation costs. Thirty percent of gross concession sales would be a reasonable estimate in cases where the concessionaire provided certain concession equipment, as is believed to be the case of the Boston Garden.

The proportion of the building's concession proceeds paid to the major tenants is one of the items which might be negotiated by building management. The industry standard for sharing concession revenue with tenants varies. The major tenant could receive up to half of the building's share. A reasonable estimate would be 35 to 45 percent of the building's concession proceeds during major tenants' events being paid back to the major tenants.

For purposes of restating the Garden's reported financial results using "arm's length" transaction percentages, a building share of 30 percent of total gross concession sales for all events was assumed. The restatement calculations further assume that 39 percent of the building's gross concession proceeds during sports tenant's events is returned to the teams. These assumptions yield an "arms length" amount of 23 percent of Garden total gross concession sales that could ultimately be retained by the facility, compared to the 13 percent reported by the Garden.

Another area of difference between Garden reported results and normal industry reporting deals with the co-promotion of events. Co-promotion occurs when management itself shares the advertising, ticket sales, cash collection and other aspects of the event as opposed to merely acting as a landlord. The Study Team's restatement of the Garden's financial results has assumed that some of the events have been or could be co-promoted by the facility. The result is increased rent/admission revenue and increased licensee participation (the percent of revenue paid to the team/act).

The impact of these changes in the estimated restatement of the Garden's financial results in Exhibit 4-4 is an increase in the 1983 net income from $337,000 as reported by the Garden to $1,209,000 on a restated basis.

Current Economic Impact

Economic impact is the amount of dollars circulated in the economy as a result of an operating business enterprise, in this case the Boston Garden. Some of the direct impacts that result from the Garden are the salaries and wages of the employees who operate the building, concessions stands, and sports teams. Others come from the patron spending that occurs outside the arena. A summary of the estimated annual economic impact of the current Boston Garden is presented on Exhibit 4-5. A more detailed analysis is presented in Chapter 14, Economic Impact Analysis.

As more fully described in Chapter 14, the gross spending of arena patrons is distributed to pay the expenses and profits of the building, tenants, concessionaire, and other non-Garden enterprises where spending occurs as a result of the patron's visit to the facility. The expenses of these non-Garden enterprises are the salaries and wages of their employees, income and real estate taxes, and the supplies and materials needed to operate their businesses. Garden employees and the employees of the businesses from which the supplies and materials are purchased, in turn, spend their income on more goods and services, such as housing and food. This creates more jobs and economic activity and is known as the "multiplier" effect.

According to the Boston Convention and Tourist Bureau, the Commonwealth of Massachusetts, Department of Commerce and Development, uses an economic multiplier coefficient of 1.7 for its economic modeling, as developed by Dr. Norman Cournoyer of the University of Massachusetts at Amherst. The Boston Convention and Tourist Bureau believes that this is a conservative estimate for the multiplier effect.

PHYSICAL EVALUATION OF EXISTING BOSTON GARDEN

This portion of the Boston Garden analysis is organized into three major sections covering 1) Evaluation of the existing Boston Garden, 2) Review of the New Boston Garden Corporation's own proposed renovation plan, and 3) Analysis of renovating the Garden to an "industry standard".

The types of events for which the Boston Garden was designed, the constraints on the design imposed by building above a train station, and building standards at the time the Garden was constructed combined to produce a facility which is unique among arenas today. The Garden's notable features include its long, narrow proportions and multi-level circulation and seating system. This evaluation of the existing Boston Garden building assesses the features of the original design and compares the facility to contemporary standards for multi-purpose arena design.

Evaluation Methodology

Information used in this evaluation was gathered by the Study Team through on-site investigations, interviews, and review of drawings supplied by the building's owner, the New Boston Garden Corp. The project team was given a facility tour and explanation of completed and proposed renovation work at the beginning of the Feasibility Study. This initial orientation to the building was followed by several inspection trips made by individual Study Team members in order to quantify and verify data essential to the evaluation.

Boston Garden personnel presented drawings and a model of the proposed renovation plans for the Garden building. They also assisted the Study Team by explaining functional aspects of the Boston Garden and by adding their knowledge to the data gathered by the Study Team.

In the process of gathering data for the building analysis, Study Team personnel carried out interviews with inspectors from the Inspectional Department of the City of Boston, the Department of Public Safety, and the City of Boston Fire Department. The Study Team also analyzed the Garden with respect to the current Commonwealth of Massachusetts State Building Code as a means of comparing the existing Boston Garden building to contemporary building standards. It is important to note that since the original use of the building has not been changed, alterations can be made to the building within the limits set by Article 22 of the Commonwealth of Massachusetts State Building Code without forcing complete compliance with current code requirements.

The Inspectional Department of the City of Boston assumed responsibility for inspection of places of assembly for 400 persons or more in 1975. Prior to that time, inspections of the Boston Garden were done by the State Department of Public Safety. Building permits are available for public inspection through the Inspectional Department of the City of Boston. The Department inspects the Boston Garden annually for compliance with the Commonwealth of Massachusetts State Building Code requirements. If no violations are found by the inspection team the occupancy permit issued by the City of Boston is renewed.

Interviews with city inspection officials revealed that a thorough inspection of the Boston Garden was carried out at the time the building changed ownership in 1976 and that work done since that time has gone through regular permitting procedures. City officials reiterated that under current inspection and permitting requirements, modifications can be made to the existing building without bringing the building up to meet current code requirements as long as the permitted occupancy for the building does not change.

City of Boston Fire Department officials were also interviewed by the Study Team in its efforts to gather background information about the building. Responsibility for such items as stair enclosures, exit widths, and path of egress has been transferred from the Fire Department to the Inspectional Department of the City of Boston. The Fire Department, however, will perform inspections if requested and posts a night detail in the Garden building during events. Fire Department inspectors stated that they feel the Boston Garden building is not a hazard and that there have been no emergency situations in the building to date.

Also important in the evaluation of the Boston Garden were tours of other arena facilities and interviews with arena managers and operators throughout the country. Information gathered through these tours and interviews established an "industry standard" against which to measure the Boston Garden (see Chapter 1).

Review of Basic Design Concept

The design of the Boston Garden is based on a vertical circulation system which contrasts with the continuous horizontal circulation concourse commonly used in arena design today. The steep overhanging balconies which give the Garden its distinct personality are reached through a network of stairways. The balconies were designed to bring spectators close to events on the arena floor with sight lines focusing on floor level events such as boxing and hockey. Support and service spaces for Garden activities are located on the northern side of the building at the arena floor level and on the second floor of the adjoining Anelex building. The typical arena's location of service spaces below the spectator concourse is precluded by the Garden's location above the passenger concourse for the B&M railroad. A schematic plan and section of the Boston Garden are shown in Exhibits 4-6 and 4-7.

Life Safety

Since the Boston Garden still is used for its original purpose as when constructed, it is a "grandfathered" structure which does not need to comply with all provisions of today's building code requirements. The current Boston Garden design could not be built under today's code; however, the Department of Public Safety, City of Boston Fire Department and City of Boston Building Officials indicated that, based on routine inspections, the building is not hazardous even though it does not have to comply with current code provisions.

The Study Team, however, remains concerned about several life safety issues regardless of the status of the building code's applicability and enforcement. The balconies are especially steep (approximately 38 degrees for side balconies) and a fall in the aisle could result in serious injury. The pipe railing in front of each row of balcony seats is a condition not known to exist in other multi-purpose arenas. Some seating has been installed with inadequate dimensions between seats, too many seats in a row, and some seats too close to the hockey dasher board. In some cases in the upper balcony, stair risers exceed the 7-1/2" maximum allowed by the Massachusetts Building Code.

Holders of the approximately 1000 obstructed view seat tickets typically do not use their seats but go to standing positions along concourse areas in the balconies - thereby impeding effective circulation width and creating potential problems during emergencies. While the building appears to have adequate amounts of unit exit widths, the Study Team believes that there are inadequate numbers of enclosed emergency stairways serving all levels of the building, and the fire escapes offer a questionable safe escape route in a panic situation. The building's 56-year old electrical system is obsolete and could create a hazardous condition. In addition, there is no adequate fire detection system.

Circulation

The Boston Garden has a confusing and inefficient spectator circulation system which results both from the 22-foot elevation of the building above the train station and from its relatively long and narrow proportions (see Exhibit 4-6). The spectator cannot easily orient himself to his destination as he enters the building, and once inside, cannot easily orient to the exitways and the outside. Spectator, service, and support circulation paths conflict at the arena floor level. Since the building is vertically organized, with three levels of seating, substantial amounts of space must be dedicated to ramps, stairways and an elevator, all of which are required features to connect horizontal pedestrian circulation areas. These vertical circulation elements are discontinuous, which means, for example, that a wheelchair-bound spectator or a user of a luxury suite must first reach the main concourse level through the Anelex Building or via one of two enclosed and disorienting ramps before using an elevator. There is a distinct lack of mechanized patron transport, and access to upper level seats by senior citizens is limited.

The confusing and inefficient circulation system makes it more difficult for the building's security personnel to ensure patron safety, especially during concerts. Because of the many stairways and corridors, there are an excessive number of places where there is not clear visibility from a single vantage point.

Circulation is not a coherent organizing element in the Boston Garden because of the many separate vertical circulation elements rather than the simple, continuous, horizontal concourse which is characteristic of modern arena design. Stairways in the Boston Garden used for vertical circulation are not continuous and are not enclosed for smoke-free emergency egress. Although it is not required to conform to current building and life safety codes, the Boston Garden building may jeopardize patron safety by relying on the existing open stairways for emergency egress. Because existing stairways are open to all levels of the arena, patrons using them for egress in the case of a fire would not be protected from smoke and noxious gases.

Fire escapes on the exterior of the building may meet unit exit width standards for emergency exiting requirements, but their safety is questionable should their use be required in an emergency situation.

The 36 leased "sky boxes" at the Garden are accessible through a combination of stairs and a single elevator located at the southeast corner of the building. Half of the sky boxes, on the northern side of the building, are connected to the elevator by a long and narrow corridor. By comparison, boxes or VIP suites are usually accessible directly from the concourse or elevators off the concourse in contemporary arenas.

Use of a single concourse for spectator circulation in modern arena design leads to a very efficient system for spectator circulation. When vertical seating aisles are provided, cross aisles are not necessary, thus affording space for more seats. Because the existing Boston Garden building relies on cross aisles for access to seats at all levels of the house, seating capacity is sacrificed for circulation space. Additionally, cross aisles result in moving spectators disrupting the views of those seated above.

Performers use the same concourse for access to the arena floor from dressing rooms as is used by spectators to reach seats on the northern side of the arena floor. Modern arena design separates spectator and performer circulation. Usually performers use vomitories from the arena floor leading directly to dressing and locker rooms. Before and after an event, performers cannot reach dressing rooms in the

Boston Garden without crossing a portion of the public concourse. Because the main concourse level serves spectators as well as performers, it is not possible to totally separate spectators and performers in the Boston Garden. During an event performers use vomitories which serve spectator seating areas as well as entry to the arena floor. This limits the ability of vomitories to fit the requirements for a full variety of event types.

Handicapped spectators enter the Anelex building, ride the elevator to the concourse level, cross the pedestrian bridge to the Garden building and then take the service elevator to wheelchair stations at the top of the first level of seating. There are approximately sixteen wheelchair viewing positions in the Boston Garden. Well-designed contemporary arenas allow patrons in wheelchairs access directly into the building at the concourse level; wheelchair viewing positions are located directly off the concourse at the top of the lower tier of seats. Boston Garden management indicated that personal service is provided to assist wheelchair-bound spectators to their seats.

Service personnel and vehicles must cross patron circulation paths at the northeast corner of the concourse. Service is separated from patron circulation in standard arena design today by restricting service functions to the arena floor level service concourse. The Boston Garden design does not separate service and patron concourses and relies on service access from the Anelex building.

Concourses and Lobby

Contemporary arena concourse finishes include materials such as terazzo floors and burnished block walls. Concourse finishes in the Boston Garden include vinyl tile floors, painted concrete walls and lay-in acoustic tile ceilings. The better-designed modern arenas incorporate a clerestory or skylight in the design of the concourse; this natural lighting feature enhances the quality of public spaces in an arena, and combined with a coherent and strong system of graphics and signage serves to orient spectators in the concourse. The Boston Garden's lobby and concourses lack a system of graphics to orient patrons and do not incorporate any natural light through windows or skylights, which would also aid in orienting patrons.

The width of the main concourse at the arena (ice) floor level of the Boston Garden is below the industry standard. In some places there is approximately twelve feet clear between concession counters and stairways. Additionally, columns inferfere with pedestrian movement in the concourses on the east and west ends of the building. Most arenas today have 30' wide concourses with a minimum width of 20'. Horizontal circulation areas at the upper balcony levels are narrow and are used for standing room by patrons who hold tickets for obstructed view seats, thereby further constricting circulation in these areas.

Sightlines

Some sightlines, such as those from seats located at the front of the balconies are superb, but this is achieved at the expense of the obstructed view seats in the last four rows of the "stadium" seating section (see Exhibit 4-7).

Sightlines in the Boston Garden were designed for viewing events on the arena floor. This design has resulted in obstructed view seats for a variety of contemporary events, such as basketball and the circus. Information supplied by the owner states that sightline configurations relative to obstructed view seats for the 1983/84 season are as follows:

Hockey - Boston Bruins

Boston Bruins seating capacity: 14,457
Boston Bruins obstructed seats: 1,119
% Boston Bruins obstructed seats: 7.7%

Basketball - Boston Celtics

Boston Celtics seating capacity: 15,372
Boston Celtics obstructed seats: 998
% Boston Celtics obstructed seats: 6.4%

Spectator proximity to the arena floor is emphasized and is a characteristic feature of the Boston Garden; however, the overhanging balconies obstruct views from seats in back rows. A visual inspection by the Study Team found that the last four rows of seats in the seating section called the "stadium" had views obstructed by the overhanging balcony.

Columns which support the overhanging balconies also obstruct views and would not be found in buildings using contemporary structural systems. By visual inspection the Study Team noted that columns obstruct a full view of the arena floor from the last four rows of seats in the "stadium" section and the last three rows of seats in the first balcony seating area on the north and south sides of the arena. There are five columns each on the north and south sides of the building.

The Garden's long and narrow proportions in plan - 201' x 438' - result in a substantial number of seats at the ends of the building being further away from the center of the playing courts than would be acceptable in contemporary arena design. Also, because of the long and narrow configuration of the Boston Garden building, the percentage of seats with prime sightlines (for example, those between hockey or basketball goals) is somewhat lower at the Garden than in modern arenas. Approximately 42% of those seats available for hockey events at the Garden are located between goals, and approximately 13% of these are obstructed view seats.

The Boston Garden seats are inferior to those typically found in contemporary arenas, and are not installed according to the Massachusetts building code. The Massachusetts State Building Code has provisions for existing buildings concerning repairs, alterations, and additions; Article 22, Section 2200.3, paragraph 6, specifically deals with "places of assembly." This article states that alterations, repairs, and/or additions may be made to an existing place of assembly provided that the seats, aisles, passageways, balconies, etc. comply with the provisions of Sections 417.0 and 418.0 which has been addressed above. In the opinion of the Study Team, replacement seating should be made to comply with today's code.

The type of replacement seating which has been installed in portions of the Boston Garden is fixed bench type seating with molded plastic insert backs and seats on a continuous rigid frame with metal armrests. This type of seating does not allow increasing the clear width when spectators stand up due to the "non-rising" seat. In some of the renovated seating areas the number of seats exceeds 14 in a row and a clear width of 18" is not maintained in those areas where required. Some rows converge on the dasher board so that it is impossible to pass by on the end of the row.

Standard seats in contemporary arenas are 20-21" wide and 32-33" back-to-back with self-rising seat bottoms. These industry standard dimensions are considered minimums required for patron comfort. New seating installed in the Garden is typically 17" wide and 30" back-to-back and is uncomfortable, although durable.

Concessions

Because of the many levels of circulation needed to serve the upper balconies of the Garden, concessions stands are scattered throughout circulation spaces at all levels, in contrast to the efficient organization of concessions in modern arenas with a single patron circulation concourse. While wide distribution of concession stands throughout an arena is desirable, from the point of view of spectator convenience and maximizing sales, the concession configurations in the Boston Garden are not cost effective and not conducive to allowing a wide variety of food to be offered.

Concession storage is located in the Anelex Building and depends on carts and dumb waiters for delivery to concession stands in the Garden Building. Beer delivery to the upper balcony is particularly difficult.

The original main concession stands have been supplemented by converting space at the upper levels of the Garden Building to concession use and by using removeable and temporary concession stands placed in circulation areas during events.

Queuing space in front of concession stands is very constricted at upper balcony locations. In one location, wire fencing is used to keep concession customers from falling on top of spectators in nearby seats because queuing space is so tight.

PATRON AMENITIES

Toilets, Telephones, and Drinking Fountains

Toilets are reasonably well distributed throughout the Boston Garden. Toilet facilities at upper balcony levels where crossovers exist were found to be the most crowded. Modern arenas provide toilet facilities accessible directly from the main spectator concourse and evenly distributed around the arena perimeter; access is more clear and direct than at the Garden.

Toilets at the Boston Garden have recently been refinished with ceramic tile floors and walls and, in some cases, new fixtures. The quality of maintenance was found to vary widely, but is equivalent to what is found in other arenas throughout the country.

Telephones and drinking fountains are available in the Boston Garden on a basis equal to other modern facilities.

Signage

Signage and graphics facilitating traffic flow and orientation is lacking at the Boston Garden. The signage that does exist uses confusing terminology (loge, stadium, balcony) and is poorly located. The Garden's seat numbering is especially complex, and existing signs do not adequately inform the spectator the direction to or location of particular seats. Exits or exit ways are difficult to find although there are illuminated exit signs as required by code. Substitution for graphic clarity with added personnel to help direct spectators is not a guarantee of safety in emergency situations.

Suites

The elimination of upper balcony seats and the creation of suites during the last several years has been a positive development at the Boston Garden. However, viewing opportunities from these suites are compromised because they are very high relative to their horizontal distance from the arena floor.

The roof trusses in the Garden interfere with sightlines from seating areas farther back in the boxes and sky boxes at the ends of the Garden are not positioned to provide a good view of the playing floor. Suites in modern arenas are located to afford the best possible view of the arena floor. Access to sky boxes is through a single elevator in the southeast corner of the building. Patrons whose box is on the north side of the building use crossovers at the east or west end of the Garden building. Some contemporary arenas have suites located completely around the circumference of the building at the concourse level and directly accessible from the concourse. Those arenas with upper level boxes usually provide multiple elevator or stairway access points to the boxes.

VIP suites in relatively new arenas, such as Houston's Summit and Landover's Capital Centre, provide private toilet facilities in each box. The Boston Garden's sky boxes do not have private toilet facilities.

PERFORMER SPACES

Ushers Lockers and Dressing Areas

Ushers at the Boston Garden use outdated locker spaces with poor environmental quality and poor quality of finishes and furnishings compared to what is found in arenas today.

Dressing Rooms & Performers Support Spaces

Because of the age of the Garden, support facilities provided for performers in the Boston Garden are below standard. More modern arenas are beginning to provide a variety of amenities in performer support spaces such as extensive training facilities and lounges, which are not available at the Garden.

ADMINISTRATION

Box Office

The street-level box office at the Boston Garden is comparable in size and number of ticket selling windows to other arena facilities. Because of the age of the building and substandard renovations, finishes and equipment are below what would be considered an industry standard. The general aesthetic quality of the public box office area is poor and uninviting, and it is isolated from other ground level activities.

Media Facilities

Press facilities at the Boston Garden are poorly furnished and finished. The press lounge and work room at the Boston Garden is physically removed from the press box seating area. Common in arenas today is an arrangement of press facilities which allows members of the media to circulate between the press box, press lounge and work room, and an interview room or performance support spaces without exposure to the public.

Adequate TV facilities are lacking in the Boston Garden. Most arenas today are cabled for both network and closed circuit TV. Because it was built before such facilities were required, the Garden uses an ad hoc approach to its TV broadcast needs. Studio vans are parked in front of the Boston Garden building on Causeway Street and cabling is run into the building through the colonnade soffit.

Technicians work in the street to make electrical connections and the vans block pedestrian and vehicular traffic on Causeway Street, thereby making entry into the building more difficult. Modern arenas typically provide at least one parking bay in the service area inside the arena for TV studio vans.

Service

Some service and support functions for the Boston Garden are housed in the adjoining Anelex Building. The "elephant walk" and a smaller pedestrian bridge join the second floor support areas with the arena floor level of the Boston Garden. In contrast, efficient design of service functions in standard arena planning locates a continuous concourse for service and support functions at the arena floor level. This type of plan minimizes labor required in loading and unloading of trucks, turn around and storage of arena flooring, staging, and seating, and places program support spaces as close as possible to the arena's performance spaces.

Large service vehicles must back up a ramp to the second floor level of the Anelex Building for unloading because turn around space in the Anelex Building is limited. Modern arena designs include interior turn around space for trucks within the service concourse. Service vehicles can only be accommodated one at a time on the Anelex Building ramp. A two way, two lane service ramp is desirable for serving an elevated building such as the Garden.

There is no high level loading dock in the Anelex Building and no service parking bay available for trucks. A loading dock capable of handling at least three tractor trailer trucks at the same time is standard in the arena industry. Most arenas today include two loading docks for trash compaction and removal which can be used for truck loading if necessary.

Trucks can be driven directly from the service access ramp onto the arena floor in many modern arenas. In the Boston Garden, truck access to and from the arena is limited by an inadequate ramp and tight turning radii.

Environmental Quality

The lack of air conditioning in the Boston Garden minimizes the usefulness and marketability of the building in summer months. The fogging conditions during a Bruins game in the fall of 1983 and the reported 97°F temperature with high humidity during the 1984 NBA playoffs in early June underscored the severity of the problem. The Garden's air handling system has a capacity for approximately four air changes an hour, but more changes per hour are recommended for a building of this volume. The air distribution system does not allow comfortable levels of air quality to be achieved in the circulation areas or the arena seating area. Part of the air quality problem is due to cigarette smoking by spectators, although it is officially prohibited in the arena proper under the City of Boston Fire Code.

BUILDING SYSTEMS

Electrical Systems

The underground feeders and most of the equipment in the transformer vaults are almost 60 years old, with inadequate space and ventilation of the interior vaults to permit replacement with modern equipment of increased capacities.

Fire Alarm and Detection System: The present installation of manual stations and gongs is no longer operable. A new fire alarm and detection system, consisting of manual stations, loudspeaker type horns with flasher lamps, smoke detectors in selected spaces (electric, telephone, T.V. equipment, sound equipment rooms), ventilation duct smoke detectors, sprinkler water flow and tamper alarms, and microphone tie-in to the arena sound system, is needed to provide fire alarm and detection comparable to systems in modern arenas.

Emergency Power for the Arena Building is presently supplied by a 90 K.W. gasoline fueled emergency generator, located in the Anelex Building. To make the Garden independent of the Anelex structure, it will be necessary to provide a new emergency engine generator set in the Garden building or new ancillary structure.

Emergency and exit lighting should be expanded throughout the structure. Emergency power for smoke exhaust should be provided.

The sound system in the arena and ancillary spaces is of advanced age, and is not of good distribution quality comparable to that found in modern arenas.

The closed circuit T.V. security system consists of cameras located at strategic points, wired to monitors in a Security Room in the Anelex Building.

Mechanical and Plumbing Systems

The building presently has no sprinklers, although it does have some fire standpipes and hose cabinets.

General Ventilation System: The Garden is supplied with tempered air from five main fan rooms. Each fan room has a supply and return/exhaust fan in the 68,000 to 80,000 CFM range each, a set of steam heating coils, air filters and intake and relief air dampers. The dampers are in poor condition, with some sections inoperative. The condition of other elements of the existing mechanical systems are as follows:

- Boiler Plant: three years old
- Hockey Rink Ice Making Plant: adequate and well-maintained.
- Sky Boxes Air Conditioning Systems (two): adequate.
- Arena Air Distribution System: adequate
- Piping, Steam and Condensate Return: adequate.
- Main Fan Rooms: equipment, except dampers and controls: adequate. Housekeeping and filters maintenance has been neglected.

History of the Boston Garden Building

The New North Station of the Boston and Maine Railroad was heralded at the time of its completion in 1928 as being "of imposing modern American architecture, solid in proportions, simple in detail. Of cheerful buff brick, trimmed with stone... the lines which greet the eye are vertical and inspiring."

Designed by the architectural firm of Funk & Wilcox of Boston in association with Feelheimer & Wagner in New York, the building is an example of what has come to be known as the art deco style. Although not an outstanding example of that particular architectural style, it is one of the few imageable art deco buildings in Boston.

The 1928 art deco building replaced an earlier North Station terminal building and consolidated the requirements of four rail lines which had previously been housed in separate facilities in the North Station area (Figures 4-1 and 4-2). The facilities constructed by the Boston and Maine Railroad to accommodate the needs of the railroad companies and their patrons included a hotel, the North Station Industrial Building, and the coliseum called the Boston Garden.

Aesthetics

Currently obscured by the elevated Green Line tracks and station, the south facade of the Boston Garden building is an art deco design typical of the 1930's and is in good repair. The rest of the building envelope bears the scars of years of accommodating change. Outdoor lighting has been added to all sides of the building in a haphazard manner, leaving exposed wiring, conduit and fixtures. A new boiler room, ice making plant and other ancillary spaces have been added to the north and west sides of the building; these changes have affected the massing of the original building and the composition of its brick facade. The north facade has had a variety of masonry materials used in patching and filling various openings. The brick facade appears to be in reasonably good condition with some evidence of cracks, spalled concrete on lintels, and leakage at parapet walls. These piece-meal additions and alterations combine to present a poor physical image of the Boston Garden Building, especially on the north facade.

Location

The Boston Garden is located ideally for its purposes, and is an excellent arena site. Although the importance of the railroad has greatly diminished since the building was constructed in 1928, subway access to the site was improved with the Haymarket to Oak Grove Orange Line subway improvements, and will be further enhanced upon completion of the Southwest Corridor project in 1986 and the possible extension of the Green Line beyond Lechmere. Under favorable traffic conditions automobile access to the site is excellent from the north; congestion on the existing Central

FIGURE 4 - 1
OLD NORTH STATION

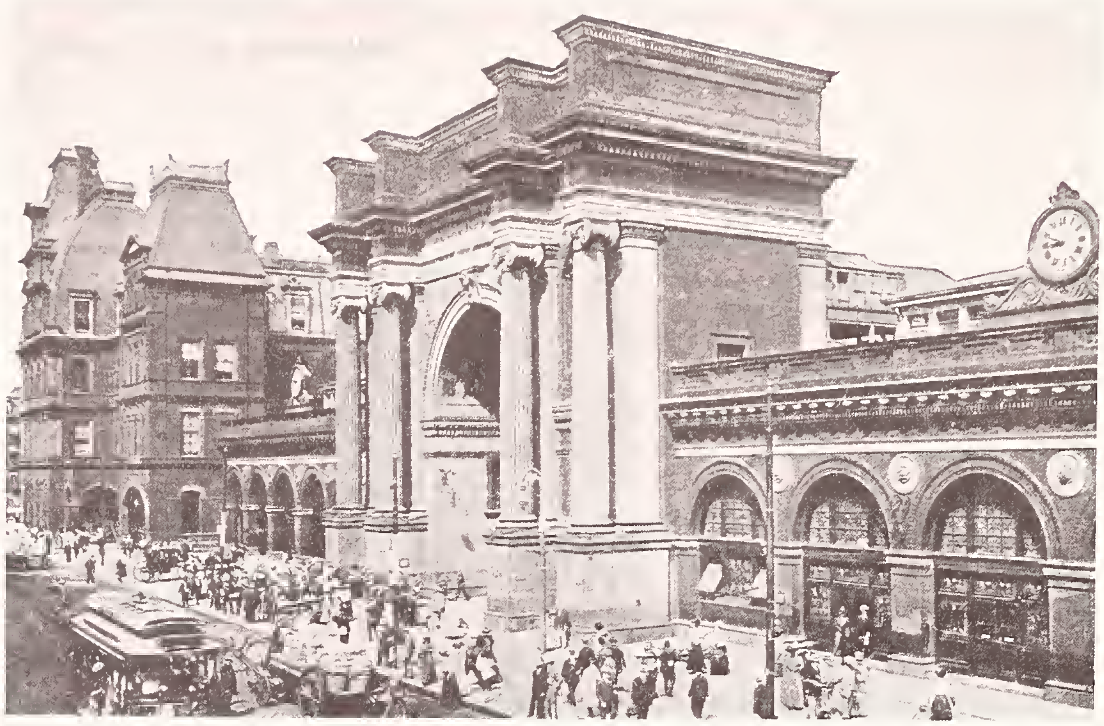
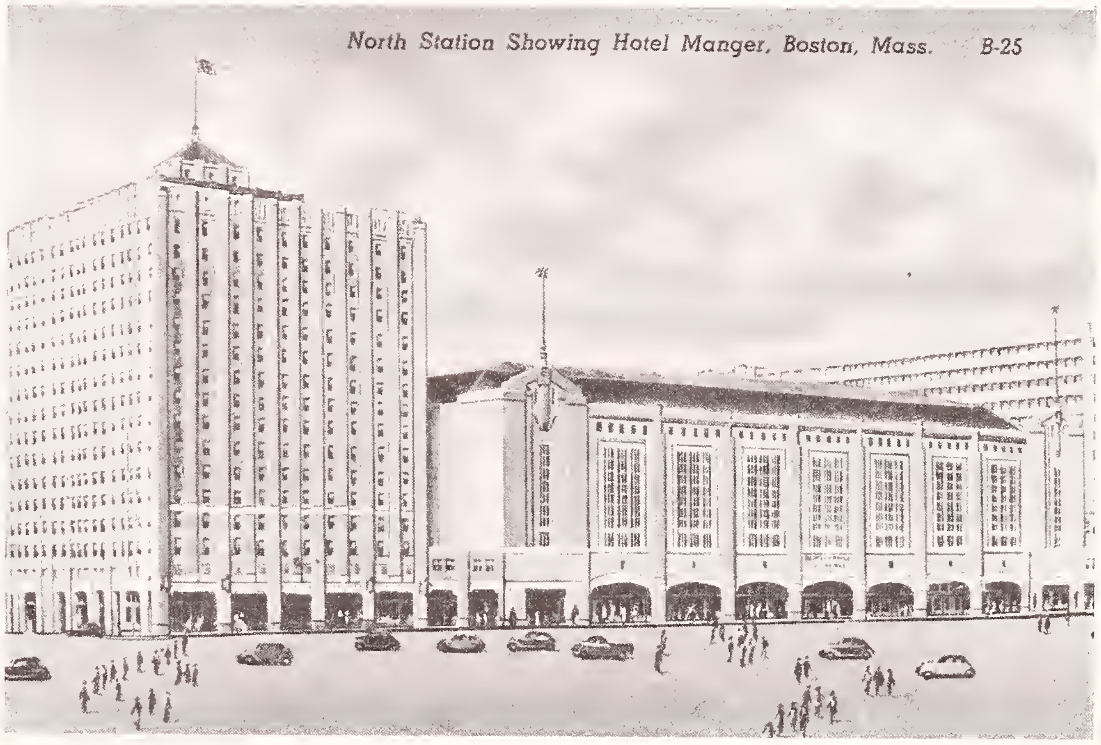


FIGURE 4 - 2
NORTH STATION,
BOSTON GARDEN,
HOTEL MANGER


North Station Showing Hotel Manger, Boston, Mass. B-25

Artery can negatively affect accessibility from the south, and from the west via the Massachusetts Turnpike. The proposed widening and depression of the Central Artery, in conjunction with the Third Harbor Tunnel, will greatly improve automobile acces to the site from the west and north. For pedestrians, the Boston Garden is a short walk from the North End, Government Center, Quincy Market, the waterfront, and only slightly further away, the downtown financial district.

Immediate Urban Context

In principle, the mixed use and joint development features of the Boston Garden serve the objectives of sound urban design goals. The mixture of arena, transportation and retail uses helps to ensure continuous humany activity rather than the sterility of a single-use urban zone. However, the physical structure supporting each of these major uses has deteriorated, and an acceptable threshold of quality is no longer achieved. The removal of the elevated Green Line structure and the creation of a high quality commuter rail station are essential steps for the area's improvement; the existence of the Boston Garden is not incompatible with these projects. However, the Boston Garden occupies a prime developable site, and may be regarded as an under-utilization of the Causeway Street frontage. In addition, the size and bulk of the Garden prohibit development from realizing the potential value of the space immediately to the north of the building. As plans proceed to develop the Charles River park frontage, to create new Massachusetts General Hospital structures, and to implement the goals of Boston Redevelopment Authority's urban renewal strategy, the Boston Garden presents itself as a difficult, but not insurmountable obstacle to establishing north-south pedestrian continuity.

RENOVATION POTENTIAL OF THE BOSTON GARDEN

There is no doubt that, in a physical sense, substantial renovations and improvements could be made to the Boston Garden. Clearly such renovations would be less expensive than a new building; this comparison is treated in detail in a later chapter of this report. The essential questions are 1) what are the relationships between benefits and costs, and 2) is it possible to renovate the Garden to an "industry standard" for contemporary arenas? To evaluate these questions, the study team reviewed the New Boston Garden Corporation's proposed renovation plans, and then developed and analyzed a more extensive renovation scenario. Costs for the latter were analyzed for purposes of conducting comparisons with a new facility.

Review of the New Boston Garden Corporation's Proposed Renovation Plan

The Boston Garden/North Station Restoration and Renovation Master Plan prepared in February 1984 and made available through the Boston Garden management was reviewed by the project team. The renovation plan was compared functionally and qualitatively with the industry standard for contemporary arena design. The proposed plans were reviewed to determine what proposals are being made to correct obstructed view seats and to improve sight lines, to correct circulation conflicts and inadequacies, to deal with functional problems in service spaces, and to improve the overall aesthetic quality of the interior spaces of the building. The Study Team reviewed the Master Plan to determine if it represented sound design and a valid implementation methodology.

The plan proposes a major addition on the north side of the existing building to house additional circulation, concessions, and support spaces. Exhibit 4-8 shows the outline of this expansion zone, and in addition, shows two possible locations of a replacement service wing.

The Boston Garden Corporation's Master Plan has recognized some of the major weaknesses of the building, and it is a reasonable attempt to remedy some of the deficiencies noted in the evaluation of existing conditions. The Study Team's major concerns with the plan are analyzed below.

Arena Floor

The proposed renovation plan does not address rehabilitation work which would increase the size of the hockey rink from its present dimension of 85' x 192", bringing it to NHL standard size of 85' x 200'.

Circulation

The proposed vertical circulation core added to the north side of the existing building does not correct several inadequacies in the building's circulation system. The proposed enclosed stair wells are all located on the north side of the arena thus leaving the east, west, and south sides without an improved means of emergency egress which would meet current life safety codes. The building apparently has not been evaluated by Department of Public Safety and City of Boston code enforcement officials with respect to the owner's proposed renovation master plan, other than for those improvements for which building permits have already been issued.

Access to the escalators and stairs in the new vertical circulation core at all levels is constrained and conflicted by the concentration of activities located in the core. Toilets, concessions, and stair wells are all located in such a small amount of space that bottle necks will occur at times of peak use, thereby impeding circulation rather than enhancing it.

Circulation paths to locker rooms, service areas, and spectator seating areas still overlap and conflict with each other at the arena level in the renovation plan.

The proposed addition on the north side of the building conflicts with the MBTA's plans to extend the commuter rail tracks southward to within 16' of the back of the building.

Concourse and Lobby

To meet industry standards with respect to the quality of spaces and finishes it is necessary to improve the image and appeal of the existing Boston Garden. The original finishes have suffered from lack of maintenance and the patch work improvements which have been made in the building during its lifetime. The renovation plan proposes to upgrade finishes and improve patron amenities. These proposals were compared to the standard of modern arena design for purposes of this review.

The renovation plan proposes to upgrade the quality of finishes in concourse and circulation areas and to improve circulation by addition of a vertical circulation core on the north side of the building.

The location of additional toilets and concessions in the planned circulation core will create congestion at the point where the greatest number of people will be circulating to the proposed stairways and escalators. New arena designs provide more generous width for circulation to patron amenities in the design of the circulation concourse. This increased concourse width is not proposed in the renovation plan. The renovation proposal does not specify finishes to be used in upgrading spaces.

Sightlines

Obstructed view seats in the arena are not significantly remedied by the arena's proposed plan. Arenas built to contemporary standards have no obstructed view seats of the kind found at the Boston Garden. The renovation plan proposes removing some of the concrete covering the columns and improving views by making columns narrower; this may not be feasible. The obstruction to a viewer's sightline could only be marginally improved and back rows of seats would still have poor sight lines. The renovation plan does not address remedying the problem of obstructed view seats caused by overhanging balconies. The number of seats between basketball goals has not been increased in the renovation plan. Seat location with respect to the center of the arena floor is the important issue in modern arenas, not proximity to the floor.

Seating

New seating which has been installed by the present owner is of a fixed bench type with metal arm rests and molded plastic seats and backs. Seats measure 17" wide and have replaced some of the 20" wide seats which were previously in the building, thus diminishing the patron's comfort. Standard average seat width throughout the country for major arenas is 20", with padded plastic or fabric seat bottoms. The Massachusetts Building Code requires that the average seat width be 20".

New seats in the Boston Garden do not have self-rising bottom portions resulting in 12" clearance in front of adjacent seat backs. This minimum clearance makes passage difficult and is less than the standard 18" clearance between rows found in contemporary arena seating arrangements.

The new bench seating incorporated as part of the renovation plan has resulted in more seats per row being installed and has cut aisle widths from 36" to 29 1/2" in some areas, thereby decreasing patron ease in circulating through seating areas.

Concessions

Location of new concession counters in the northern vertical circulation core will lead to spectator congestion. Circulation and queuing space in front of the new concession counters is only twelve feet. Not only is this inadequate for queuing, but it creates a bottleneck in the circulation paths to toilets, stairs, and escalators.

Service to concessions at the upper seating levels is inefficient compared to modern arena design which locates all concessions at the spectator concourse level and thus economizes service functions.

Patron Amenities

Additional toilets for men and women included in the north addition to the Boston Garden will significantly improve the level and quality of patron amenities in the building; however, the masterplan's design of the new toilet facilities for both men and women shows a single door into the toilet room. Modern arena plans have separate entrance and exit doors to avoid spectator congestion during peak period use of toilet facilities.

Signage

The owner's Renovation and Restoration Master Plan does not specifically address improvements to graphics and signage in the existing facility.

VIP Suites

The Renovation and Restoration Master Plan states that sky boxes have already been improved to provide "appropriate luxury accommodations". The Study Team believes that finishes and furnishings in the sky boxes do not meet the industry standard level of quality.

Sight lines from the Boston Garden sky boxes are not uniformly good and the renovation plan does not propose to improve viewing conditions from the sky boxes.

Performers Support Spaces

The renovation plan only addresses improvements of these areas in general terms and does not specify what improvements are to be made to bring locker and dressing areas up to quantitative and qualitative standards.

ADMINISTRATION

Media Facilities

Improvement of media facilities is not addressed in the renovation plan.

Box Office

Improvements to the existing box office are not addressed in the renovation plan.

Maintenance and Service

Service and program areas are not fully addressed in the renovation plan. The renovated Garden building would still be dependent on service access and storage space in the Anelex building. The renovation plan does not address improvements necessary to existing service spaces such as provision of high level loading docks, parking bays for TV studio vans, and access for more than one delivery vehicle at a time, which is standard in arenas today.

Tenant, office and facility admnistrative areas now located in the Anelex building will need to be replaced if the Anelex building is removed to make way for the Central Artery project. The renovation plan does not address replacement of the functions now housed in the Anelex Building. The Garden owner's design concept for renovation would have to be substantially altered to properly accommodate a new support service wing.

Environmental Quality

The plan does not adequately address the problems of the Garden's poor environmental quality; adding air-conditioning in this building will be quite difficult. A sound masterplan should indicate a basic design and implementation methodology concerning this important issue.

The present mechanical rooms do not provide sufficient space for expansion of the mechanical equipment. Thus the planned air conditioning cannot be provided without major relocation of mechanical equipment, loss of other space used and/or expansion of the building. Because of these restraints, the mechanical performance may be compromised or operate at a lower efficiency than otherwise possible.

Site Development Review

Any Boston Garden renovation plan must reflect proposed development scenarios in the North Station area. However, the owner's renovation plan does not adequately take into account the various development projects which impact the North Station area, including the MBTA's North Station Improvements project and the Central Artery/Third Harbor Tunnel project. The extension of commuter rail trains to the back of the Garden will make the objectives of the master plan much more difficult to realize, and will make the renovation concept as currently documented infeasible.

If the Green Line is elevated, the bridges from the Anelex building to the Boston Garden would have to be removed. An alternative means of getting service and delivery functions into the Garden building would need to be developed.

The MBTA plans to extend the commuter rail tracks to the back of the Boston Garden building. The design of the renovated Garden does not show the train sheds and other railroad elements in relationship to the proposed building elevation. The train shed may affect design of the glazed area of the vertical circulation core. Circulation to trains shown on the proposed design is constrained and obscured by the new Boston Garden lobby and circulation core on the north side of the building.

Depression of the Central Artery would require removal of the Anelex building. The renovation scenario refers to replacing storage and service functions with an addition to the eastern end of the north side of the Garden building, but is not specific regarding service circulation ramping required to the arena floor level, emergency vehicle access, and relationship of a service addition with railroad functions on the same site.

Phasing and Implementation

The owner's plan does not contain a schedule for implementation nor a detailed phasing strategy. In the case of a major renovation in a building being continuously utilized for public assembly, it is essential to describe an implementation strategy as part of the overall improvement concept.

Ultimately, the quality of a planning document is revealed in its execution, and it is reasonable to interpret the renovation plan in light of recently completed and ongoing modifications to the building. The plan is already being implemented in an incremental approach in order not to disrupt current activities, but phasing construction of improvements need not preclude a more comprehensive renovation. As is reasonable to expect given private sector ownership of the building, the majority of improvements made to date have either been technically necessary (new roof) or oriented to those which would have a relatively short financial payback, such as restaurants and ground level retail.

RENOVATING THE BOSTON GARDEN TO AN "INDUSTRY STANDARD"

As part of its evaluation of the Boston Garden, the Study Team considered whether or not it is possible to renovate the Boston Garden so that it 1) served the full potential of the Boston market and 2) met a standard of quality consistent with contemporary standards of arena design.

The program and scope of work presented in this section describe a renovation scenario for the existing Boston Garden building which attempts to meet current building code requirements, to provide modern arena program standards, to bring the Garden up to an acceptable level of quality of finishes and aesthetics, and to respond to changing site parameters. This renovation scope is more extensive than that proposed by the Garden's current owner.

In order to extend the useful life of the Boston Garden building any renovation scenario must first respond to changes affecting the North Station site which are proposed by agencies having rights of way which have a direct affect on the existing building. Of greatest importance to any proposals for renovation of the existing building are the relocation of the elevated Green Line, the extension of the commuter rail tracks, and the depression of the Central Artery.

Any one of these changes to an existing site parameter directly affects the existing Boston Garden building as well as any possible renovation scenario. The renovation scenario described in this chapter assumes that all of the projects will occur in the near or long term and that their affect on the Boston Garden must be accommodated. The affects which must be accommodated are:

1) Replacement of the building support functions now housed in the Anelex building.

2) Accommodation of a transit platform for the new Green Line T stop located on the east side of the Boston Garden building.

3) Coordination of expansion of the existing building to the north with extension of the commuter rail tracks.

As diagrammed in Exhibit 4-8, the renovation scenario described below would replace functions now housed in the Anelex building by construction of a 40,000 S.F. addition to the Garden building at the northeast corner of the building. The addition would include a ramp to bring service vehicles to the arena floor level as well as two new service elevators and enclosed emergency egress stairs. Construction of such an addition in this location would require careful coordination with the new Green Line tunnel which is currently planned in this alignment. Renovation of the train concourse level of the existing building will accommodate the new Green Line T platform and the extension of the commuter rail tracks.

PROGRAM FOR A FULL RENOVATION

While it is not physically possible to renovate the existing Boston Garden building to meet all of the standards of a modern arena because of structural and spatial limitations inherent in the building, the following program and scope of work was developed in order to allow a comparison of the Boston Garden in a renovated condition to the desired industry standard building program determined by external industry standards and market analysis.

Circulation

Improve vertical circulation by adding the following to the existing building:

- two freight size elevators
- pair of reversible escalators
- enclosed stairways for emergency egress

Concourse

- provide new lighting throughout, recessed at ceiling
- sprinkle concourse areas
- new finishes would include terrazzo tile floors, slat metal ceilings, and covering walls with 2" veneer of burnished block

Arena Activity Area

- clean arena risers and coat with opaque concrete sealer.
- cover walls with veneer, 2" burnished block soaps
- Paint ceiling, exposed structural members and undersides of balconies. Remove obsolete wiring and other items from underside sides of balconies and provide TV monitors in obstructed view seat locations.

- install new lighting in seating area
- replace handrails
- provide new basketball floor to match the existing parquet floor if and when required.
- provide new hockey dasher boards

Seating

Remove existing seating and replace with 20" wide theatre-type self-rising seats throughout the existing arena seating area.

Signage

A comprehensive graphics program is required, and would include the following elements:

- directional signs
- life safety required signage
- advertising
- handicapped signage
- special graphics to improve aesthetic ambiance

Concessions

Expand concessions and concession storage areas at each spectator circulation level. Upgrade electrical and ventilation provisions.

Patron Amenities

Toilets: provide required number of fixtures and new finishes in those areas which have not yet been upgraded.

- ceramic tile floors and walls
- replace existing lighting
- new metal pan ceiling
- new fixtures, including lavatories, water closets and urinals.
- new toilet accessories and partitions
- provide convenient drinking fountains and telephones throughout building.

Skybox Suites

Refinish and furnish sky boxes with upholstered seating for 10-12 persons, upgraded floor and wall finishes and built-in cabinet work. This work can be done to suit individual tenant preferences.

Performer Support Spaces

- refinish and refurnish existing home and visiting team locker rooms
- provide 4,000 S.F. additional locker and dressing room space

ADMINISTRATION

Press and Media Facilities

- relocate press work room, lounge and interview room to be directly accessible from press box and performer support area
- provide cable runs for closed circuit and network TV
- provide area in service bay for parking of one TV studio van and cable hook up point
- provide 8,000 S.F. of administrative and team office areas with first class finishes and furnishings to replace existing in Anelex building

Box Office

- refinish existing box office area
- provide new signage, graphics and advertising in box office
- install computer terminals at ticket windows

Service

New Space - construct approximately 40,000 s.f. of storage area to replace existing in Anelex building including the following:

- vehicular ramp to arena floor level
- security and control point
- concession storage
- loading dock for 3 - 5 trucks
- refrigerated storage
- shop areas
- 200 psf - floor loading
- raw storage
- storage for basketball floor, hockey dasher boards, temporary seating, and concert stage
- Zamboni storage and discharge area

Building Systems

Structural:

- provide allowance for structural tests.

Electrical Requirements:

- provide new emergency power system
- relocate transformer vaults
- provide cabling for TV
- provide a building surveillance and security system
- provide TV monitors at underside of balcony

Mechanical Requirements:

- provide air conditioning
- provide energy management systems

Plumbing:

- replace and provide new plumbing as required
- provide new ice system in hockey rink slab
- provide required fire alarms
- sprinkle support spaces

Building Envelope

Clean and repair existing brick, repair concrete lintels and patch work, remove fire escapes, re-flash where parapet walls show water damage.

LIMITS TO RENOVATING THE BOSTON GARDEN TO AN INDUSTRY STANDARD

Because of limited site dimensions and the constraints under which the Boston Garden was originally designed and constructed, there are limitations to how the building can be renovated. Therefore, it is not possible to improve the Garden to the level found in modern arenas. Some of the negative factors of the building which cannot be mitigated and those areas that can be brought up to an industry standard are outlined below.

Arena Activity Area

The arena activity area in the Boston Garden is smaller than would be found in arenas today, and without removing seats, cannot be increased in size. The standard floor for hockey measures 85' by 200'. The hockey floor in the

Boston Garden is 85' x 192' and cannot be increased in the lengthwise dimension without removing some seating.

Circulation

Circulation would be greatly improved through addition of escalators, elevators and enclosed stairwells. However, because the main spectator concourse and service and performers support spaces would still all occur at the arena floor level in any renovation scenario, the Boston Garden cannot be renovated to achieve the efficiency and clarity of circulation found in modern arena design.

The Garden arena floor level is 22 feet above street level and adds another element of complexity to the circulation system existing in the Boston Garden. This added veritical circulation most seriously affects service access to the arena floor level and spectator access to the building. The fact that commuter rail activities will continue to occur at North Station and that extension of the commuter rail tracks is proposed, means that the proposed renovation scenarios cannot fully solve the problem of vertical circulation for service and for patrons.

Concourses

Upgrading of patron concourses, as described by the Study Team in the industry standards renovation scenario, still would leave the Garden behind modern arenas in the quality of its circulation space. While extensive improvements to the finishes of the horizontal and vertical circulation areas is feasible, changing their basic organization is not. Introduction of natural light, creation of a sense of openness to improve orientation and simplification of the organizational concept can be achieved only partially by an addition on the north side of the Garden. Although extensive renovation may provide adequate area for circulation, the scale of the original concourse would remain confined.

Seating

Upgrading to an acceptable quality of seating will result in a reduction of the total number of seats in the building. It is not feasible to increase seating capacity by expanding beyond the existing confines of the building.

Seating in the existing Boston Garden is stated by the owner to accommodate 15,509 persons.

Today's standards for arenas would require approximately 18,000 seats to accommodate the demand in the Boston marketplace. The industry standards renovation scenario would replace the existing 17" wide seats with 20" wide seats, thus decreasing the number of seats by approximately 12%.

Because of the vertical circulation system on which the Garden is based, there are a large number of cross aisles which reduce seating capacity. A renovation scenario such as that proposed by the owner of the Boston Garden building would eliminate the need for some cross aisles on the north side of the building and seating could then be increased. The new Boston Garden Corporation's renovation plan states that 150 new seats can be added by using this space. However, other proposals for increasing the quantity of seats in the Boston Garden such as cantilevering a balcony on the north side of the building have been studied and do not appear feasible. In summary, the quality of seats in the Garden can easily be improved; however, the quantity of seats will be decreased and cannot meet the number demanded by the market today.

Sightlines

The remaining obstructed view seats in the Boston Garden cannot be improved unless both balcony systems were removed and replaced; this is considered to be not feasible.

Because of current building technology modern arenas are built with a clear span which allows the house of the arena to remain free of columns. Modern arena design also favors less steeply sloped balconies which do not overhang lower level seating areas. The overhanging balconies at the Garden are the major cause of obstructed view seats and cannot be eliminated. Similarly, the columns on the north and south sides of the Garden are major elements which block spectator sight lines and which cannot be remedied. Because the columns at the Garden support the balconies they cannot be eliminated as they were at the Montreal Forum where columns supporting the roof were removed when a new structural system for the roof was constructed.

Concessions

New concession stands and storage could be improved to match the quantity, arrangement and quality of concessions in a modern arena. Graphics and finishes associated with concessions could also match industry standards.

Signage

A renovated Boston Garden can equal an industry standard arena in the quality of signage and graphics. Considerable effort and expense will be required in this area to overcome the disrienting quality of the building's circulation system.

Skybox Suites

Even extensive renovation of the sky boxes at the Garden does not remedy poor sight lines from some of the boxes. Because of their location at the highest level of the building, sightlines are only good from the front row of seats in the boxes in the center of the arena. Locating suites at concourse level guarantees the best available sightlines in the arena for patrons who would pay extra for the boxes, however, it is not possible to implement this approach at the Garden since there is inadequate space. Access to sky boxes will be greatly improved by the addition of elevators serving this level on the northern side of the building. Boston Garden sky boxes would ideally have toilets located in each box, but this improvement would be extremely difficult to implement.

Administrative Offices

Construction of new space to accommodate administrative and tenant offices in the renovation scenario will provide industry standard or better faciltiies. In many state of the art arenas, office areas are located below grade at the service concourse level thus making these office areas all internal rooms. By constructing an addition to replace service and office functions in the Anelex building, the proposed renovation scenario can provide well-designed and attractive above-grade spaces for offices.

The renovation scenario analyzed by the Study Team can accommodate a TV studio van parked in the new service addition. Cabling for TV can be incorporated in renovation work.

Maintenance and Service

Construction of 40,000 SF of service and maintenance area to replace that lost in the Analex building provides the opportunity for construction of industry standard quantity and quality of maintenance and service functions.

Access and circulation for service functions would remain problem areas because of the required vertical circultion to reach the arena floor level at + 22' and the unresolved circulation conflict caused by the multiple use of the main concourse level.

Building Efficiency

While the proposed improvements would improve the flow of spectators, overall efficiency of the building will not be enhanced. The gross sq. ft. of floor area per spectator will increase; it is difficult to improve the efficiency of the building without compromising spectator comfort and amenities.

Relationship to Other Projects

A major renovation of the Boston Garden, as in the construction of a new arena, would have complex relationships with the major transportation improvement projects which are proposed for the North Station area.

Since the MBTA has stated a policy of extending the commuter rail tracks to within sixteen feet of the rear of the Garden, any addition to the north of the Garden would have to be a partial air-rights structure. While the Study Team believes that a north addition design can be accomplished in coordination with MBTA commuter rail tracks and platforms below, the scope of construction and cost would be substantially more extensive than envisioned by the current owners of the Boston Garden.

The need to replace the Anelex building service functions if the Central Artery depression proceeds creates an even greater coordination issue with proposed MBTA facilities. Both the management of the Boston Garden and the Feasibility Study Team agree that the desirable location for the Anelex replacement is at the rear of the Garden at its northeastern corner. However, because this is the location of the proposed Green Line subway alignment, there are substantial design and construction issues that make implementation of this alternative especially difficult and costly. The design of the north circulation addition to the Garden will be impacted by the location and design of the replacement service wing. However, design of this wing and its structural relationship to the Green Line tunnel below would not take place until the decision is made to proceed with the Central Artery. Therefore, a major portion of the Garden renovation is dependent upon the ultimate fate of the Central Artery/ Third Harbor Tunnel project.

Construction Schedule

For purposes of analyzing the constraints on a full renovation and its costs, a construction schedule was developed.

Features of the schedule are:

- 27 month construction period beginning July, 1985 and ending September, 1987
- No temporary displacement of the major tenants.
- Concentration of work during summer months when there are fewer events. This schedule provides three full summers to implement the renovation program.

FULL RENOVATION CONSTRUCTION COST

Based on the above full renovation scope of work, a construction cost estimate was prepared in mid-1984 dollars. Costs are summarized below, and a detailed breakdown is provided in the Appendix:

01 GENERAL CONDITIONS	$2,224,000
02 SITE WORK	540,000
03 CONCRETE	3,820,000
04 EXTERIOR WALLS	2,980,000
05 METALS	500,000
06 INTERIOR PARTITIONS	996,000
07 ROOFING	90,000
08 DOORS & ENTRANCES (INCLUDED IN 04 & 06)	-
09 FINISHES	1,960,000
10 SPECIALTIES	780,000
11 EQUIPMENT	865,000
12 FURNISHINGS	1,735,000
13 SPECIAL CONSTRUCTION	685,000
14 CONVEYANCE SYSTEMS	1,000,000
15 MECHANICAL	4,200,000
16 ELECTRICAL	2,625,000
CONSTRUCTION COST TOTAL (1984 DOLLARS)	$25,000,000

Boston Garden's Ability to Financially Support an Owner-Sponsored Renovation Program

As previously outlined in the discussion of current financial results, the existing Garden generated $337,000 in net income in 1983, as reported by Garden management. After restating this for "arms-length" contractual relationships, net Garden income could have approximated $1,209,000 for 1983. Both income figures are based upon the Garden's actual 1983 event and attendance levels (198 and 2,148,000 respectively).

A renovation program would present the opportunity to increase event and attendance levels, even though the overall seating capacity may be slightly reduced. For example, an air conditioned building would open up additional dates for events which currently do not perform in the Garden during the warm weather.

The effect of increasing the number of events from the 1983 level of 198 was analyzed. Concerts represent the single largest opportunity, with an additional 30 events being assumed. The mix of Celtics and Bruins games was also changed slightly to reflect a more typical year. The result was an increase to 232 events (slightly lower than the probable market potential) and annual attendance of approximately 2.6 million.

The estimated financial impact of this increased event and attendance scenario is shown in Exhibit 4-9. Using the Garden management's reporting methodology, Garden net income may increase to $1,175,000 from the $337,000 reported in 1983. Using "arm's length" reporting methods, the Garden's annual net income potential is estimated to be $2,590,000. Again, it is important to note that it is unlikely that these results would be achieved in the current building with the contractual arrangements that appear to exist. In any case, the increased event/attendance levels (and thus the changes in operating income) would result only from a more aggressive marketing posture, a significant alteration of the internal contractual arrangements, and a substantially renovated Garden.

Exhibit 4-10 presents a range of hypothetical renovation investments, ranging from $6 million to $16 million. Exhibit 4-10 also shows a range of financing amounts along with the related annual interest, depreciation, and principal amounts. These amounts were derived assuming a 14 percent cost of borrowing, a 20-year level debt service loan, and a 20-year straight-line depreciation schedule for the new assets. It was assumed for purposes of this analysis that the maximum supportable renovation cost is that which would yield a break even bottom line after the addition of the interest and depreciation expense associated with that renovation investment.

Referring again to Exhibit 4-10, the increased event/attendance levels could yield a "Garden-reported" net income of $1,175,000. This amount would support additional financing of approximately $6 million, using the interest and depreciation assumptions as outlined previously. Between $12 million and $14 million of financing could be supported if additional profitability from "arms length" contractual agreements is included with the basic profitabiltiy improvements possible from increased event/attendance levels. That analysis, shown in Exhibit 4-9, yielded a possible net income of $2,590,000, which is slightly below the interest and depreciation expense associated with a $14 million renovation scenario using the conventional financing methodology discussed above.

The assumed financing methodology outlined above is a highly conservative approach. It indicates that a maximum renovation investment of $14 million may be justified by the New Boston Garden Corporation, under the potential for increased events and attendance associated with a renovated facility. This conclusion further assumes that Garden management would aggressively market the renovated building and achieve future event and attendance levels which are unprecedented in the recent past.

In reality, it is not possible to say precisely what maximum level of renovation investment would be attractive to the current Garden owners. A full assessment of the financial merits of a major real estate renovating venture, like the Boston Garden, is a highly complex and technical exercise and must take full account of the tax status and long run investment objectives of the investor group. In the case of the Boston Garden, substantial investment tax credits may be available from a major renovation program, if the project received Internal Revenue Service-approved historic property or qualified rehabilitation designations. Additional tax benefits could be generated if the Garden's reported operating losses were passed on to reduce the Delaware North Companies reported taxable income. If the Delaware North Companies could take full advantage of both the investment tax credits and the Garden operating losses, the amount of renovation investment justifiable from the parent company's perspective may exceed the $14 million which appears to be the maximum justifiable from the New Boston Garden Corporation's perspective.

Three additional points must be made concerning the Garden owner's view of the financial merits of a major Garden renovation investment:

- Even if a renovation investment of $14 million or more could be shown on paper to be financially worthwhile, there is no assurance that either the New Boston Garden Corp. or the Delaware North Companies would undertake such an investment. Additional factors would be considered by the owners, such as the relative attractiveness of competing investment opportunities elsewhere in the parent company's operations and the owner's judgement on the controllability of risk factors over the period when the returns from the renovation investment are expected.

- It is likely that the Garden owner's renovation priorities would favor rehabilitation of the Garden's retail and commercial spaces, since increases in operating revenues may occur much faster through these improvements than through upgrades to the arena-related areas.

- As presented elsewhere in this chapter, the Study Team believes that a renovation investment of approximately $39 million may be required to bring the Garden as close as possible to industry standards, including design fees, contingencies, and inflation, but excluding any land acquisitions. It is unlikely that this major investment could be financially justified from the perspectives of either the New Boston Garden Corp. or its parent company. Therefore, an extensive industry standards renovation of the Garden would probably never by undertaken by the current owners.

TOTAL PROJECT COST FOR PUBLIC OWNERSHIP AND RENOVATION

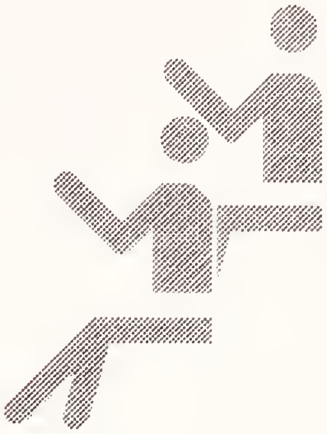
In order to compare the cost of a publicly-sponsored full scale renovation of the Boston Garden with the cost of a new arena, the Study Team conducted additional cost analysis.

The figures below summarize the total project cost if the Boston Garden were to be acquired and renovated by the MCCA. These figures include the cost of replacing the service functions that are currently provided in the Anelex building.

Base 1984 Construction Cost	$25,000,000
Construction Contingency @ 10%	2,500,000
Sub-Total	$27,500,000
Professional Fees @12%	3,300,000
Garden Purchase	15,000,000
Additional Land Purchase	2,000,000
Sub-Total	$47,800,000
Project Contingency	1,540,000
Total Project Cost (mid-1984)	$49,340,000
Inflation	5,195,000
Total Project Cost	$54,535,000

INVENTORY AND ANALYSIS OF POTENTIAL NEW ARENA SITES

5



INVENTORY AND ANALYSIS OF POTENTIAL NEW ARENA SITES

5

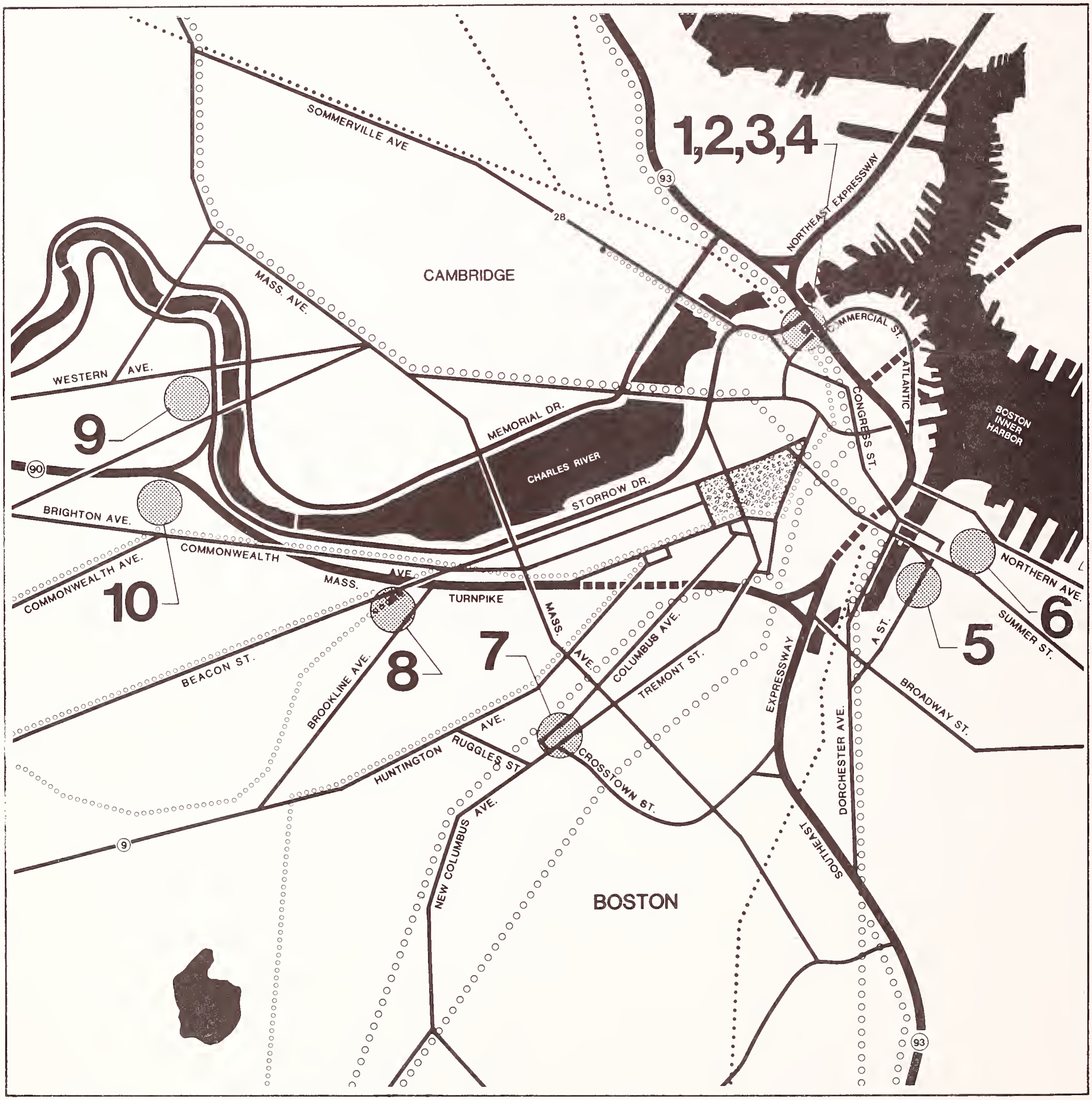
SUMMARY OF WORK PERFOMED

After careful deliberation by the MCCA, ten potential arena sites were selected for evaluation by the Study Team. The list was generated according to several criteria: 1) an arena for the Boston metropolitan area should be located in Boston proper, 2) the North Station area should receive serious scrutiny as a result of the 1981 Area Committee's findings, 3) other sites were selected for analysis because they initially appeared to have one or more characteristics that suggested they may be a suitable arena location. The sites are located on a Boston area map in Figure 5-1.

The sites evaluated during Phase I of the Feasibility Study were the following:

1) North Station Area: North of Garden
2) North Station Area: North of Ramps
3) North Station Area: Replacement of Garden
4) North Station Area: Renovation of Garden
5) Fort Point Channel/South Station Area: Rose Property
6) Fort Point Channel/South Station Area: Cabot, Cabot and Forbes Property
7) Southwest Corridor Area: Parcel 18
8) Kenmore Square/Mass Pike
9) Allston Area: Western Avenue
10) Allston Area: Conrail Train Yard

FIGURE 5-1


1,2,3,4
5
6
7
8
9
10
CAMBRIDGE
BOSTON
SOMMERVILLE AVE
MASS. AVE.
WESTERN AVE.
MEMORIAL DR.
CHARLES RIVER
STORROW DR.
BRIGHTON AVE.
COMMONWEALTH
COMMONWEALTH AVE.
MASS. AVE.
TURNPIKE
BEACON ST.
BROOKLINE AVE.
HUNTINGTON AVE.
RUGGLES ST.
NEW COLUMBUS AVE.
CROSSTOWN ST.
COLUMBUS AVE.
TREMONT ST.
EXPRESSWAY
SOUTHEAST
DORCHESTER AVE.
A ST.
BROADWAY ST.
SUMMER ST.
NORTHERN AVE.
CONGRESS ST.
ATLANTIC
COMMERCIAL ST.
NORTHEAST EXPRESSWAY
BOSTON INNER HARBOR
28
90
93
9

SITE LOCATION MAP

▬	EXPRESSWAY
▬	ARTERIAL ROAD
—	COLLECTOR ROAD
◌	SITE LOCATIONS
○○○○○	FIXED RAIL TRANSIT
∘∘∘∘∘∘∘∘	TROLLEY TRANSIT
....	COMMUTER TRANSIT

0 200 800 1600

This chapter summarizes the potential new arena site analysis which was conducted during Phase I of the Feasibility Study; more detailed alternative site analysis is contained in the Appendix. The following chapter continues the site analysis into a more detailed comparison of two preferred sites, and culminates in the recommendation made at the end of Phase I to continue with detailed analysis of a new arena at North Station.

POTENTIAL SITES FOR A NEW ARENA

North Station

Access: The several site alternatives in the North Station area have excellent access through various MBTA rail options. North Station is served by the Green Line, Orange Line and four branches of the commuter rail system. A major MBTA bus interchange is a few minutes away at Haymarket Square. Transit access to the area will improve with the Southwest Corridor Project's completion in 1986; then it will be possible to reach North Station via the Orange Line directly from the Back Bay and Northeastern University. The North Station Transit Improvements Project will improve station facilities, which can be better integrated with a new or renovated arena. Access to the North Station sites by automobile is good because of its proximity to the Central Artery/ I-93, but frequently occurring heavy traffic conditions can inhibit accessibility during peak commuting hours. Access from the west via the Mass. Pike is somewhat indirect, and from the northeast is dependent upon traffic conditions in the Sumner Tunnel. The Central Artery/Third Harbor Tunnel project, resulting in the widening and depression of the artery, will improve traffic flow, but as currently designed access from the south will be somewhat indirect. The three North Station sites south of the expressway ramps have excellent pedestrian access from the Waterfront, the North End, Government Center, and just beyond, the downtown financial district. All means of access to the site north of the ramps are inferior compared to the other three North Station sites. Construction of an arena larger than the existing Boston Garden will require additional parking capacity, but there are limited opportunities for providing additional parking without paying substantial premiums.

Site Capacity: The dimensions of sites south of the expressway ramps are horizontally limited, and construction cost premiums will be necessary to allow accommodation of the desired seating capacity. While horizontally less constrained, construction of a new arena on the site north of the ramps could conflict with accommodation of parking and the development plans of Massachusetts General Hospital. The proposed extension of the commuter rail tracks and platforms to the rear of the Boston Garden will require a new building to be an air-rights structure. The horizontal constraints on all of these sites make accommodation of a vehicular service ramp to a new arena particularly difficult.

Community Impacts: Since the Boston Garden currently functions at North Station, the impacts on the community are well-known and not a matter of forecasting. There is adequate parking capacity for the current building, and the street network can accommodate the peak traffic conditions. The area's restaurants benefit directly from the proximity of the Garden. A moderate increase in seating capacity and number of events would not substantially change the current impact of the Boston Garden. The transportation improvements proposed for the area will further minimize the impact of an arena on the North End and surrounding area. Because of the site location behind the Garden, community impacts during construction would be minimal, but construction will adversely affect commuter rail users.

Development Costs: The costs for development of a multi-purpose arena at North Station would be negatively impacted by the various site constraints. Extension of the MBTA's commuter rail tracks will make new arena or renovated Garden options more expensive. The horizontal dimensional constraints require phasing in some cases and inhibit cost effective contractor mobilization and construction processes. While site acquisition costs can be partially offset through the resale of developable land, the two new arena building scenarios south of the expressway ramp would require the acquisition of the Boston Garden, at present a viable business.

1) North Station
NORTH OF GARDEN
(Exhibit 5-1)

Summary: The site between the Boston Garden and Storrow Drive ramps has many distinct advantages over other sites; 1) excellent transit and vehicular access, 2) high visibility and identity with the downtown, 3) strong pedestrian links with the downtown, 4) minimal community impacts, and 5) joint development opportunities on Causeway Street. An arena on this site would require a limited second construction phase for some vertical and horizontal circulation on the present Garden site, and would require the taking of the Garden. The disadvantages are related to the limited site size and likely air rights requirement which result in higher net development costs for the site. Because of the clear advantages over most other sites, the North of Garden site is highly ranked and was recommended for further consideration. The concept could provide an excellent facility, but there are substantial cost premiums to build an arena at this location.

2) North Station

NORTH OF RAMPS
(EXHIBIT 5-2)

Summary: The site north of the ramps over the commuter rail tracks shares some of the advantages of site 1; 1) good transit, railroad and regional highway access, 2) high visibility and partial identity with the downtown and 3) minimal impacts on the community. The disadvantages are somewhat greater, however: 1) local vehicular access is more limited, 2) sense of isolation because of surrounding ramps, 3) cost premiums for air rights over tracks, and 4) some conflicts with BRA plans for mixed-use of the larger "Phase II" site. This site was recommended for further consideration only if the other two new North Station sites were found to be not feasible for a new arena.

3) North Station

REPLACEMENT OF GARDEN
(Exhibit 5-3)

Summary: Without phasing of construction at North Station, it would be necessary to displace events for several years. However, a two-phased construction of an arena, with Phase 1 behind the Garden and a substantial Phase 2 replacing the Garden, has several advantages: 1) excellent transit and vehicular access, 2) high visibility and identity with the downtown including a Causeway Street frontage, 3) larger site capacity allowing for more seats, 4) strong pedestrian connections with the downtown, 5) minimal impacts on the surrounding area, and 6) joint development opportunities on Causeway Street. The disadvantages include similar cost premiums associated with the North of Garden constraints and an additional premium for the second phase addition to seating. The replacement of Garden concept was recommended as a fall back to the North of Garden site if the site constraints in the latter case proved to be too limiting. The concept would provide an excellent facility if development costs could be reduced.

4) North Station

RENOVATION OF GARDEN
(Exhibit 5-4)

Summary: The full evaluation of this alternative is documented in Chapter 4, Evaluation of the Boston Garden. A complete renovation of the existing Garden would have a variety of advantages: 1) excellent transit and vehicular access, 2) the same strong identity with the downtown and improved exterior image through restoration of the art deco facade, 3) strong pedestrian links to the downtown, 4) potentially lower development costs, and 5) minimal community impacts. The disadvantages are significant, however; 1) construction may require closing the Garden for one or two seasons; keeping the Garden open during construction will delay completion time, add cost premiums, and may affect the quality of the renovation. 2) joint development opportunities for the North of Garden area are limited because of its isolated location, and 3) the renovation project does not conform to BRA's phase I urban renewal plans for the larger site.

5) Fort Point Channel/
South Station Area

"ROSE PROPERTY"
(Exhibit 5-5)

Access: The Rose site enjoys good transit access through its proximity to South Station and fair vehicular connections at present; future highway and bridge plans will provide much improved access. Pedestrian connections to downtown are nearly as good at North Station with the walking distance being about the same. Transit service is a 5 to 8 minute walk away at South Station, which provides the main capacity Red Line, commuter and long distance rail, and bus connections. Present vehicular access to the site is limited by poor connections to the Mass Pike and Central Artery, a problem attributable to both congestion and a poorly connected local street system. Construction of the new Northern Avenue bridge combined with local street improvements, is necessary in the short range to provide better access. The Third Harbor Tunnel/Seaport Access Road and depressed Central Artery would substantially improve regional access, if combined with other local street improvements. Improved pedestrian connections are desirable and could be provided through a weather-protected walkway across the Summer Street bridge and along the channel to the site. Existing and projected parking in the area would necessitate approximately 1400 new parking spaces which could be provided on site and on the railroad property two blocks to the south of the arena site.

Site Capacity: The site (12 acres) is ample for an arena footprint and includes several potential joint development parcels. While full realization of both an arena and potential office development would require some building takings along Necco Court, the site is largely vacant. The proposed Third Harbor Tunnel right-of-way will encumber the southwest corner of the site, but future air rights development opportunities are possible. The location on the channel provides good frontage and visibility for both the arena and joint development options. The high water table and soil conditions may preclude sinking the floor level much below grade. However, the site is otherwise less encumbered than most others evaluated.

Community Impacts: The arena use and building mass are well-suited to the current and proposed land-uses in the channel area, but the traffic impacts prior to completion of Third Harbor Tunnel construction may pose problems to the greater South Boston community. The proposed land-uses for the site by the city and owners have been for an arena/conference center or for residential use for the past 10 years. While the Fort Point area has been poised to develop as renovated and new space, transportation has limited this growth. The lack of an overall city land-use and transportation policy has inhibited coordinated development and is urgently needed. If an Arena were to be included in such a policy, the necessary short and medium term local traffic patterns, parking, and pedestrian connections, as well as supporting zoning, massing and land-use directives could be facilitated. If the arena is to be acceptable to the community, a clear program for accommodating arena traffic and hopefully reducing seaport trucking impacts would be needed. A commitment to construction of the Northern Avenue bridge is likely to be the first step. The site provides a high visibility, downtown location.

Development Costs: The costs for arena construction would be little impacted by site premiums, and the property acquisition costs could be offset by recaptured joint development opportunities for several small office towers. The costs of infra-structure improvement to streets, bridges and pedestrian ways could be jointly shared by arena, developers and the State.

Summary: The Rose property at Fort Point Channel has many advantages because of 1) location near transit, 2) strong downtown image, 3) relatively unencumbered site and 4) reasonable overall development costs. Primary disadvantages relate to the vehicular access problems which currently exist for the area and which may be compounded by an arena. The site will be a highly desirable downtown location if interim and longer term traffic issues are addressed. Street and bridge improvements are technically possible, but are not yet part of a public transportation improvements policy.

6) Fort Point Channel/ South Station Area

"CCF PROPERTY"
(Exhibit 5-6)

Access: The CCF site has fair transit access via South Station, limited vehicular access at present and prospects for improved vehicular connections with the construction of the Seaport access road. The CCF site is about a 10 minute walk from South Station, and access could be improved through changes in the local street network. Transit services are otherwise the same as the Rose property, but with less access to the MBTA's Broadway station. Vehicular approaches to the site depend on the short term construction of the Northern Avenue bridge and local street improvements. Pedestrian connections to the downtown are physically and psychologically further than for the Rose property because of site location "behind" the industrial development. More traffic improvements than are presently planned would be required in both the short and medium range to provide full access. The inadequate amount of existing and proposed parking stocks would require construction of some site parking in the 700-1000 car range.

Site Capacity: The site is of ample size (about 9 acres) for an arena, parking and some joint development. The site is flat, on filled land, and generally unencumbered by buildings or easements. Primary orientation would be to new Northern Avenue and proposed new development of Athanas property and Commonwealth Pier. The building section could place the floor on grade and be well-serviced, particularly with the Seaport access road in place. Shared parking is possible with other new developments.

Community Impacts: While land-use and building mass would be compatible with surrounding development, the existing vehicular access problems could cause objections by the larger community. As with other downtown sites, the development potential for the site as mixed-use and office space may be of greater value than an arena. The absence of a sanctioned overall land-use and transportation plan makes assessment of an arena versus other uses for the site more difficult. Community objections to current traffic impacts on the neighborhood from seaport bound traffic could be overcome with construction of the third harbor tunnel and the Northern Avenue bridge in addition to several local street improvements. Induced development such as restaurants and bars may be in conflict with residential growth in the area. Construction impacts of the Third Harbor Tunnel would require coordination but is generally off-site.

Development Costs: The arena construction costs would be moderate because of the unencumbered site, while the land costs might be high because of site development potential. Joint development opportunities for office space as planned by the owners might reduce the total development costs depending on how much the site would accommodate. Parking construction would add to the cost but could be shared use with joint and other adjacent development.

Summary: The CCF site shares some of the advantages of the Rose property including 1) ample site capacity, 2) compatible land-use and 3) joint development opportunities. The disadvantages of the site are somewhat greater, however, and include 1) poor existing vehicular access and potential community objections, 2) poor visibility and lack of identity with the downtown, 3) less transit access and 4) conflict of use with higher development potentials anticipated by the owner. Although the site is technically feasible, the fact that development costs are likely to be greater, the lack of transit access, and the poor imageability all

FIGURE 5-2
SOUTHWEST CORRIDOR AREA

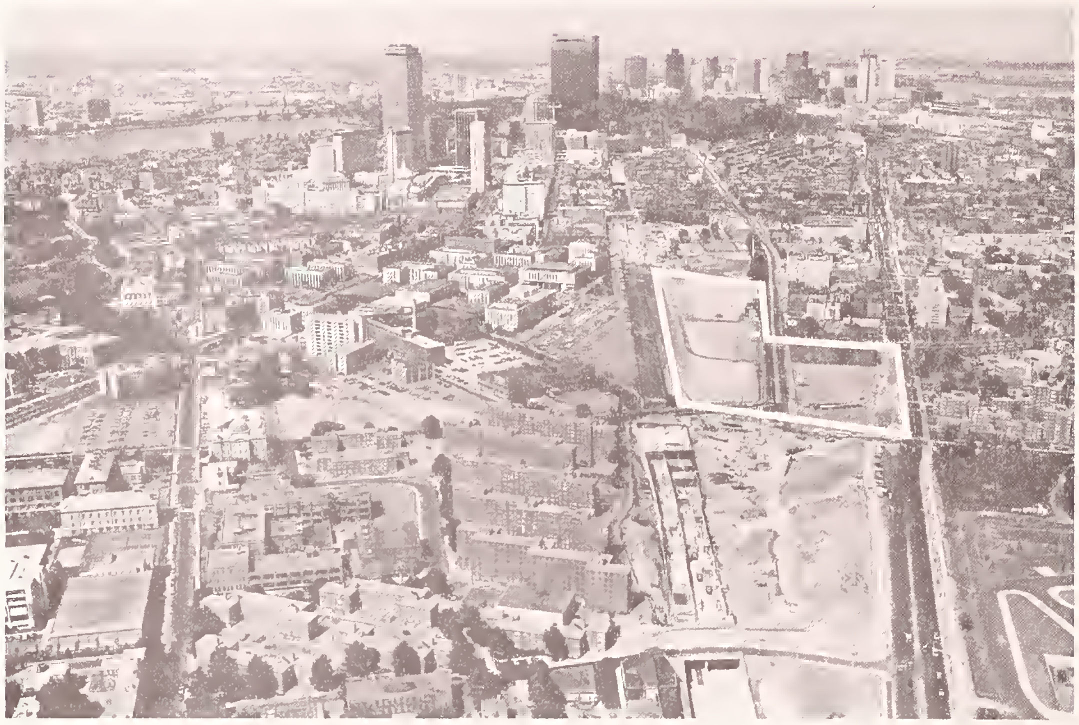


FIGURE 5-3
KENMORE SQUARE AREA

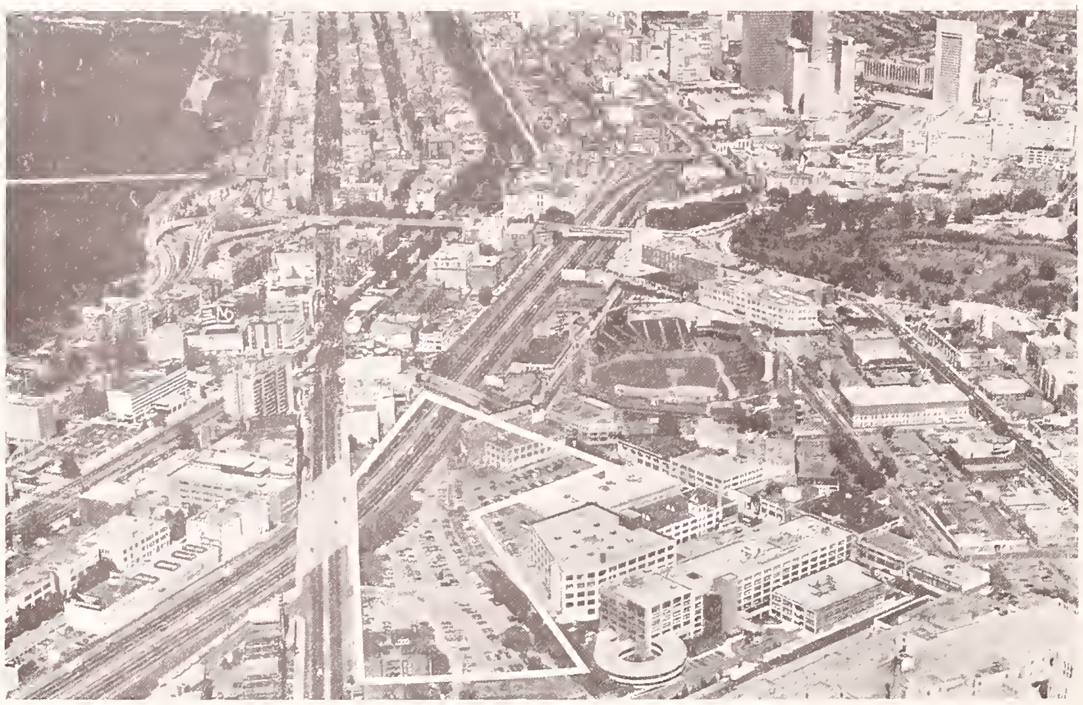
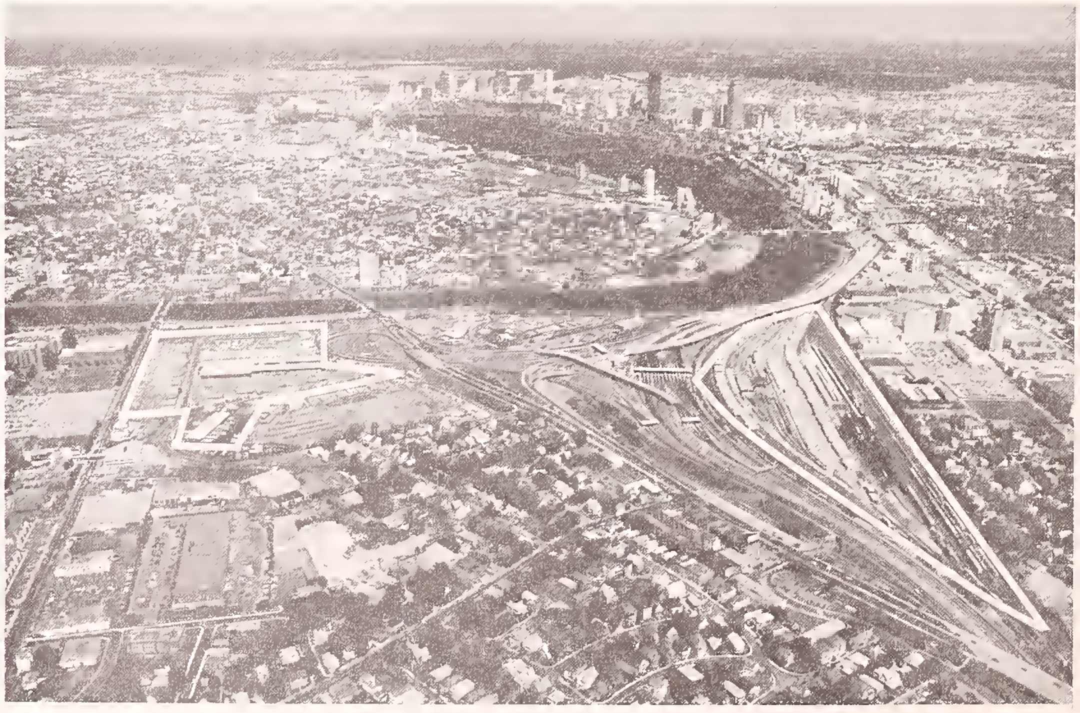


FIGURE 5-4
ALLSTON - TURNPIKE AREA



make the site far less attractive than the Rose property on the channel.

Southwest Corridor Area

7) PARCEL 18 (Figure 5-2 and Exhibit 5-7)

Access: The completion of the Southwest Corridor Project in 1986 will provide good to excellent transit connections to the site, while vehicular access is poor due to limited arterial street connections to the Southeast Expressway and other regional highways. Ruggles Street Station will provide Orange Line transit to the southwest and downtown, as well as commuter rail and bus connections. The nearby Green Line on Huntington Avenue provides surface light rail service on the Arborway Line. Because of limited vehicular access, the overall regional site access ranks as fair to poor. While there is ample parking capacity at Northeastern and other institutions, nighttime classes preclude shared use with an arena. Therefore a parking component of 5500 to 6000 spaces would probably be required as part of an arena's development.

Site Capacity: While the site can physically accommodate an arena footprint, substantial changes in proposed roadway and pedestrian networks would be required, and additional locations for parking would be needed. It should be noted that Ruggles Street Station has been designed assuming a pedestrian path through the center of the site which would be precluded by an arena footprint. Proposed utility easements and future light rail transit connections might also encumber the site. Soil conditions are poor and the Stoneybrook culvert is below grade. Parking sites could be identified within a 5 to 10 minute walk if shared use could be arranged with neighboring institutions. Structured parking would be difficult to finance due to a limit on potential revenues caused by the low cost of existing parking.

Community Impacts: Incompatibility of an arena with existing and proposed residential uses nearby and a mixed-use complex on the site poses a major problem. Parcel 18 has been long committed as a mixed-use development town center for Roxbury through efforts of the "Parcel 18 +" task force. An arena and induced development would be unacceptable to the community and seen as a breach of the Southwest Corridor Project's land-use policy. The traffic and activity impacts on adjacent residential areas would be harmful would likely cause instability. An arena on Parcel 18 would not be perceived as related to the downtown but rather to the Corridor and South End.

Development Cost: The project package would be moderate due to relatively low land and building cost, but there would be a premium for a parking garage. The limiting factor is not the cost of parcels 18 and 17X but whether or not they would be made available for arena use by the MBTA because of prior commitments.

Summary: The Parcel 18 location for an arena is found to be generally unsuitable for several reasons; 1) serious conflict of use with community residential areas and committed Parcel 18 mixed-use development, 2) limited access by arterial connection to the Southeast Expressway and other regional expressways, and 3) poor identity with downtown Boston.

Kenmore Square Area

8) KENMORE SQUARE/ MASS PIKE

(Figure 5-3 and Exhibit 5-8)

Access: Transit access is fair through Green Line connections at Kenmore Square, but vehicular access is limited with no direct connections to the highway system. General access to the site is comparable to present access to Fenway Park. The Green Line has limited capacity and the site is distant from downtown transit interchanges. The site is adjacent to the Massachusetts Turnpike, but existing ramp connections are distant (Copley Square and Allston) and a full set of new entrance and exit ramps would be extremely difficult to build. Because of limited transit access and lack of supply, parking would be required for about 3000 to 4000 cars. It could be built on air rights over the Mass Pike at considerable expense and shared with Kenmore Square and Fenway Park.

Site Capacity: The available site area would accommodate an arena with multi-level access and a portion of the parking. Additional parking would be needed on air rights over the Mass Pike. Shared parking use with Fenway Park and Kenmore Square development might be possible physically but would strain the local street system. The site is currently used primarily for on-grade parking, but also contains several large loft-type buildings.

Community Impacts: Construction of another major sports facility whose seasons would overlap with baseball at Fenway Park will have serious negative impacts on the neighboring residential areas because of traffic and crowd effects. Positive economic impacts will accrue to Kenmore Square restaurant and retail businesses. The lack of an accepted land-use or transportation plan for this in-between neighborhood makes it difficult to say that an arena is incompatible with land-use policy, but the consequences seem obvious. If Mass Pike ramps could be built to relieve both Fenway and arena traffic problems, many of these impacts would be diminished, but the engineering problems and lack of extra right-of-way seem to preclude such a solution. In balance, the negative community residential impacts substantially outweight the benefits to Kenmore Square, and could result in substantial community opposition.

Development Costs: Arena costs are moderate with additional parking costs especially for the Mass Pike air rights creating a premium for the Kenmore site. High water table might preclude sinking the arena floor, but it could easily be placed at grade. The air rights span across the Mass Pike is not difficult, but all air rights structures are costly and the parking revenues might not offset the costs.

Summary: The Kenmore site is difficult but not impossible for the following reasons; 1) Transit and vehicular access are limited and even when combined provide the same poor access as Fenway Park, 2) Arena impacts on the Fenway community would be substantial, compounding and extending the Fenway Park impacts to 12 months a year from the current 6 month season, and 3) the site does not enjoy a downtown identification although it would have good visibility from the Mass Pike. For these reasons the Kenmore site is considered to be marginally feasible but undesirable as an Arena location.

9) Allston Area

WESTERN AVENUE
(Figure 5-4 and
Exhibit 5-9)

Access: Vehicular access to the site is good because of the Massachusetts Turnpike, but mass transit is too far away for effective use. Parking would be required for approximately 6000 cars because of the lack of transit and limited existing parking. While the vehicular connections via the Mass Pike as well as Storrow and Memorial Drives are convenient, they favor western sectors of the region. South and North shore users would have to pass through downtown to the Mass Pike to get to the site. A Third Harbor Tunnel would improve North Shore access. The lack of adequate transit creates a major problem for the site by limiting regional use for the broader range of events to be accommodated. Structured parking can be provided on site but may be difficult to finance because of very limited non-Arena use potential. Pedestrian connections to Harvard and Central Square are in place but are long walks. Service access would be from the Mass Pike and Western Avenue.

Site Capacity: The 29 acre site is the largest of those evaluated and is ample to accommodate the Arena, parking and possible joint development. The site is relatively unencumbered, containing several warehouse shed buildings and considerable truck trailer parking. Modification to the off ramps might require using portions of the eastern edge of the site. Location of the Arena would probably be facing the Charles River for best identity and visibility.

Community Impacts: The neighboring residential area of Allston would probably be opposed to an arena on this site based on night-time disruptions by arena-generated traffic. While Harvard University and existing neighboring businesses may question the arena located at this site, the use is generally compatible with adjacent uses. The Massachusetts Turnpike Authority is currently considering optional uses for the site, but there are no apparent public land-use policies set by the neighorhood or city. The likely induced development of restaurants and other support services would have trouble locating in the area and would not be welcome. Construction impacts would likely be minimal because of ample staging areas and access.

Summary: While the Allston/Western Avenue site is very large and generally unencumbered, it has several major liabilities. Access is unacceptable because of the site's remoteness from public transit; the construction of parking for a full 6000 cars would cause major burdens on development costs. The lack of identity with downtown Boston and greater association with Cambridge is also a significant site liability. For these reasons the site is not recommended for a new arena.

10) Allston Area

CONRAIL SITE
(Figure 5-4 and Exhibit 5-10)

Access: The transit access for the Conrail site would be the limited capacity Green Line on Commonwealth Avenue - a 5 to 10 minute walk away. Vehicular access is nonexistent and would require major new ramps to the Mass Pike and new local street connections. Because of limited transit service, a full parking component of 6000 new spaces would be required. Pedestrian connections to Commonwealth Avenue would be along local streets. Service access would require the same highway and street modifications cited above.

Site Capacity: The 10 acre banana-shaped site has adequate capacity if all railroad tracks could be removed. If any tracks were required to remain, the building sections and site access would be substantially more complex and result in construction cost premiums. Arena and parking could be accommodated easily on the site. Joint development would be limited because of the location. The site is depressed by 10 to 15 feet from the surrounding residential area and is likely to have a high water table.

Community Impacts: Traffic impacts would adversely affect the adjacent Brighton and Allston residential neighborhoods and Boston University facilities, even with new Mass Pike connections. The arena use of the railroad site would be generally compatible with the partial institutional, industrial, and turnpike context, but not with the residential area to the southwest. While no official land-use policy could be identified for the site, the MBTA is seriously considering leasing or purchasing the site from Conrail for purposes of storage of commuter rail stock and use of the existing trackage. Induced development would seek Commonwealth Avenue locations for existing or new businesses. Construction traffic impacts would be substantial unless ramp connections were in place prior to start-up. The site is more identified with Brighton and Boston University than with downtown Boston, but would have good visibility from the Mass Pike.

Summary: The Conrail site has very limited transit and vehicular access which would require major investments in new Mass Pike ramp connections to improve. The site lacks downtown identity. It also has potential land-use conflicts with both abutters and continuing rail use. The size and capacity seem ample, but substantial structured parking with limited shared use potential would be required.

For these reasons this site is not recommended for consideration as a site for a new arena.

PREFERRED SITE ANALYSIS

6

Newport

PREFERRED SITE ANALYSIS

6

Summary of Work Performed

Following the research and analysis process which narrowed down the preferred new arena sites to two, North Station and Fort Point Channel/South Station, the Feasibility Study Team undertook to evaluate more specifically the design potential of each site. The key findings are summarized below.

North Station

Design Analysis

The several alternative sites at North Station were studied at 1"=40' scale in plan and 1"=16' in section to determine dimensional and other constraints that may affect the siting of a new arena (see Exhibit 6-1). Although Site 2, North of expressway ramps, has fewer horizontal constraints than Site 1, its isolation is considered a significant negative feature. This location would require the Nashua Street side to become the front of the building. Integration into a large air rights development between Causeway St. and the expressway ramps would be possible, but this scenario would place north-south access between the arena and Causeway Street too much under the timing and design control of a developer. Furthermore, the combined demand for additional parking to serve an arena and a major development would have to be met on a site other than that occupied by the arena. Following evaluation of North Station sites 1 and 3 and a determination that a new arena could physically be designed to fit south of the expressway ramps, Site 2 north of the ramps was dropped from further consideration.

Design analysis of Site 1, between the existing Garden and the elevated expressway, concentrated on an investigation of both horizontal and vertical constraints. The Study Team determined that an arena with between 17,000 and 18,000 seats could technically be built in this area without requiring the removal of the Boston Garden until the new bulding was temporarily operational. Ultimately, however, additional space to the south would be necessary to accommodate some major vertical circulation elements.

More extensive phasing of arena construction was evaluated in the consideration of Site 3, Replacement of Garden. This alternative would allow the MBTA's Green Line to be elevated in its new alignment, but would reduce the dimension between the arena and Causeway Street so that development opportunties would be reduced. This approach would allow the arena to have its own frontage along an open space north of Causeway Street, but the overall project costs would be substantially higher than other alternatives.

The dimensional constraints at North Station requiring a partially phased construction result from the fact that the expressway ramps are supported on battered piles which extend in a southerly direction below the surface. Additionally, a fire lane easement may have to be maintained between the construction site and the existing Boston Garden. The structural design concept that initially emerged from a consideration of these north-south constraints was a two-way space frame supported on four points. Through the use of cantilevers, the major foundations could be constructed away from the existing lines of support along the expressway and the Boston Garden.

The accommodation of the MBTA's relocated Green Line tracks was another important component of the design analysis of sites 1 and 3. It was determined that the elevated Green Line could not fit within the footprint of the arena. The horizontal geometry of the space below the first tier of seating is inconsistent with track alignment requirements. Furthermore, it is necessary that all of the arena's service level space be available for arena support functions, and that accommodation of the Green Line in this zone would be detrimental to the functioning of the arena.

Dimensional constraints in the east-west direction, although not directly impacting phasing, include the GSA building on the west and the Anelex building on the east. For purposes of current planning, it was assumed that new arena construction would have to avoid the Anelex building even though it may be eventually taken for the depression of the Central Artery.

It is considered to be technically feasible to build an arena above the commuter rail platforms at North Station if special provisions for mechanical vertical transportation of spectators are provided. One possible approach to accommodate this requirement is the creation of a multi-story skylit space along the South side of a new arena. In this space would be a system of escalators connecting the train concourse at street level with the arena floor level and above, the arena's own pedestrian concourse. Fronting on the south side of the arcade would be a new multi-use high rise development, perhaps built behind the existing Boston Garden's art deco facade. The arcade at ground level could serve to bring the new MBTA Green Line/Orange Line Station into a unified relationship with the five commuter rail platforms, the GSA building, and the major vertical circulation components of the new arena (see Exhibit 6-2). An additional urban design strategy associated with this solution would be a service zone and ramp along the east side of the complex so that the western edge could be developed as the pedestrian-oriented connection between Causeway Street and the Charles River. It should be emphasized that these design notions, as part of the project's Phase I site analysis process, were very preliminary in nature, but eventually formed the basis for subsequent work in the Study's second phase.

Analysis of parking supply and demand in the North Station area indicates that the total existing capacity is approximately 5,100 spaces. Assuming no use of on-street spaces, the largest arena which could be built just north of the existing Garden would justify providing parking capacity for 1,360 cars (Exhibits 6-3 and 6-4). It is recommended that, because of limited space south of the expressway ramps, a new parking structure be built north of the ramps, either on land currently owned by Massachusetts General Hospital or on air-rights above the commuter rail tracks.

Fort Point Channel/ South Station

The physical design constraints applicable to a new arena are much less severe at the "Rose property" site at the southern side of Fort Point Channel compared to North Station. The design analysis of this site yielded a concept for a new arena which could be built without interfering with the construction of the Third Harbor Tunnel, whose alignment goes through the southern end of the site. The focus of construction coordination of a new arena on this site with the Third Harbor Tunnel would involve the necessary improvements to the local street network required for access to parking and the arena site.

The design concept for an arena at Fort Point Channel is based on minimizing extraneous vertical circulation. A site plan deliveating the key organizational principles for an arena on this site is shown in Exhibit 6-5. The arena would be built at or slightly below grade in order to minimize the distance between street level and the pedestrian concourse dividing the two principal zones of seats. This site would allow most of the vertical circulation to the pedestrian concourse to be accommodated outside the building; this is inherently a less expensive and more efficient solution than building an elevated arena.

The siting of the building in the center of the site would allow a multi-story office development to be built between the building and Melcher Street.

Turned on its long axis perpendicularly to the water's edge, the arena would be a building whose scale is compatible with existing large buildings fronting this portion of the Channel. The edge of the Channel would be developed as a waterfront walkway and park; this improvement would serve not only the pedestrian access to the building from South Station and the financial district, but would enhance the development of a comprehensive system of pedestrian access along Fort Point Channel. The water-oriented end of the arena could house one or more restaurants which could successfully operate at times other than when events are held. The arena would be distinctly visible to the pedestrian crossing the Channel on Summer Street from South Station.

An analysis of the parking supply and demand characteristics associated with an arena on this site indicates that approximately 1400 additional spaces would have to be provided (Exhibits 6-6 and 6-7). This parking can easily be sited on relatively inexpensive former railroad land to the south of the site. The arena site itself is substantial enough in size such that some on-grade parking, perhaps for V.I.P.'s and lessors of suites, could be located near the building.

Comparison of the Two Preferred Sites

Cost Premiums

In addition to developing preliminary design concepts for purposes of comparing the North Station and Fort Point Channel/South Station sites, the feasibility study team conducted a comparative analysis of cost premiums associated with each building scenario. Because of the various horizontal and vertical constraints at the North Station site, it will be substantially more expensive to construct a new arena there (see Exhibit 6-8). These costs will be partially offset, however, by a greater probable acquisition cost of land for the Fort Point Channel site. Combining the differences in construction premiums and site acquisition costs indicate that a new arena would cost approximately $13-$21 million more to construct at North Station than at Fort Point Channel/ South Station. These figures represent the differential in 1984 dollars in terms of construction and acquisition costs, only, and do not take into account the added affect of fees and inflation. The derivation of this figure is explained in Exhibit 6-9.

Summary

Many factors must come into play in weighing the merits of the two sites, North Station and Fort Point Channel/South Station, which have much to recommend them as locations for a new arena. The comparative summary below indicates the strengths and weaknesses of each site according to the key selection criteria:

	North Station	Fort Point Channel/ South Station
ACCESS	Excellent; will improve with MBTA North Station improvements and the Southwest Corridor Project. Access by automobile from the south would be somewhat indirect via Leverett Circle or ramps near the Sumner Tunnel under current Central Artery plans.	Excellent, if the Third Harbor Tunnel/ Central Artery project is built, but plans to build this project have not yet been approved. Approximately 5-7 minute walk to South Station, which is being developed into a major transportation center. Local street improvements required.
SITE CAPACITY	Constrained; construction cost premiums will be incurred to accommodate seating capacity that is consistent with market demand (18,000 - 20,000).	Not constrained; the construction of the Third Harbor Tunnel would not inhibit an arena of the desired size from being constructed.
COMMUNITY IMPACTS	An arena at this site would continue the well-established tradition of the Boston Garden. It is expected that an arena would have substantial support of the arena's restaurant businesses.	An arena at this site would constitute a new use, and there is strong neighborhood concern for area-wide traffic circulation. Traffic impacts can be partially offset by improvements to components of the local street network which connect to regional highways.
SITE ACQUISITION ISSUES	Acquisition of city-owned land should be relatively simple. This solution requires taking of Boston Garden, which could be a complicating factor for planning, budgeting and implementation scheduling.	This arena concept requires land acquisition from two private owners whose positions on site availability are unknown at present. Acquisition may be further complicated by the Central Artery Third Harbor Tunnel project, which runs through the site. Connection to parking requires easement or land swap with Post Office, a Federal agency.
QUALITY OF ARENA	Because of site premiums, spending on finishes may have to be limited. An air-rights arena is more difficult to efficiently operate.	Lower basic cost may allow greater expenditures for finishes and site amenities. At grade arena will be more accessible and easier to operate.
DEVELOPMENT COSTS	Including allowances for air-rights construction, horizontal dimensional constraints and construction phasing, an arena at this site would cost approximately $13-$21 million more to develop than an arena at Fort Point Channel.	While more expensive for site acquisition, the substantial savings for construction of a more conventional arena here means that this would be a less expensive project.
RELATED DEVELOPMENT	An arena at this site is consistent with BRA planning for the area's renewal. The arena would be nicely integrated with multi-storey development in front of it along Causeway Street. However, an arena may not be highest and best use of the site.	Little comprehensive planning has been done in this area, but substantial building activity is expected to be concentrated here as Boston enters its next phase of growth. An arena next to the Channel does not preclude other water-related development. The project could make a major contribution to pedestrianization of the Fort Point Channel. Good development sites may be created adjacent to the arena.

	North Station	Fort Point Channel/ South Station
ECONOMIC IMPACT	There is excellent spin-off economic activity because of adjacency to North End, Quincy Market and Waterfront bars and restaurants. Total economic impact will be similar at both sites.	This is a developing area; an arena could enhance utilization of nearby restaurants and stimulate the creation of new ones.
PHASING REQUIREMENTS	Some phasing of construction would be required. Special vertical circulation elements, required by the air-rights condition, could be constructed only following demolition of the existing Boston Garden.	The site does not propose any substantial requirements for phasing the building's construction. Final construction of some of the on-site parking areas and nearby joint development could take place only following the completion of this segment of the Third Harbor Tunnel.
PARKING	There is a substantial parking supply in the area. A new arena would justify the creation of approximately 1400 spaces. Additional parking is required because of spaces lost to arena/MBTA construction and because of larger seating capacity. A definite parking garage site has not been identified, but it would likely be north of the expressway rammps.	The nature of the area's parking supply is likely to change in the future. Parking supply on the fan pier will be reduced, but up to 2000 new spaces will be accommodated on South Station air-rights. A deficit of approximately 1400 spaces can easily be satisifed on additional under-utilized railroad land to the south of the arena.
RELATIONSHIP TO MBTA PROJECTS	The preferred design concept at North Station is feasible only if the new Green Line is built as a subway under the site. An arena on this site could be extremely well-integrated with the new Green Line/Orange Line subway station. Substantial design and technical coordination will be required during design and construction; this is a critical necessity, without which one or both projects could be jeopardized. There may be a possibility for some arena project costs to be offset against the MBTA improvements.	An arena could act as a stimulus for the use of the South Station Transportation Center as a fully integrated facility with 2000 spaces of air-rights parking. Choice of this site for an arena would not create particularly difficult coordination issues. It would be extremely desirable to have the South Station project complete before a new arena became operational.
RELATIONSHIP TO CENTRAL ARTERY/ THIRD HARBOR TUNNEL PROJECT	Staging areas and construction sequencing require coordination. Early demolition of the Anelex building resulting in a replacement Garden service building could affect site availability and complicate construction phasing. Decision on Central Artery very desirable before final design of arena. Design solution for serving arena will be especially impacted by Central Artery design.	The success of an arena on this site depends to a great extent on the construction of the Third Harbor Tunnel/ Central Artery project and, particularly, the access/egress provided by the seaport access road. Site acquisition policies and implementation will have to be coordinated, as will construction sequencing. A portion of the site adjacent to the arena cannot be completed until this section of the tunnel is completed. While the decision to proceed with the project has been made by State and local officials, the project has not yet been approved by the Federal Government.

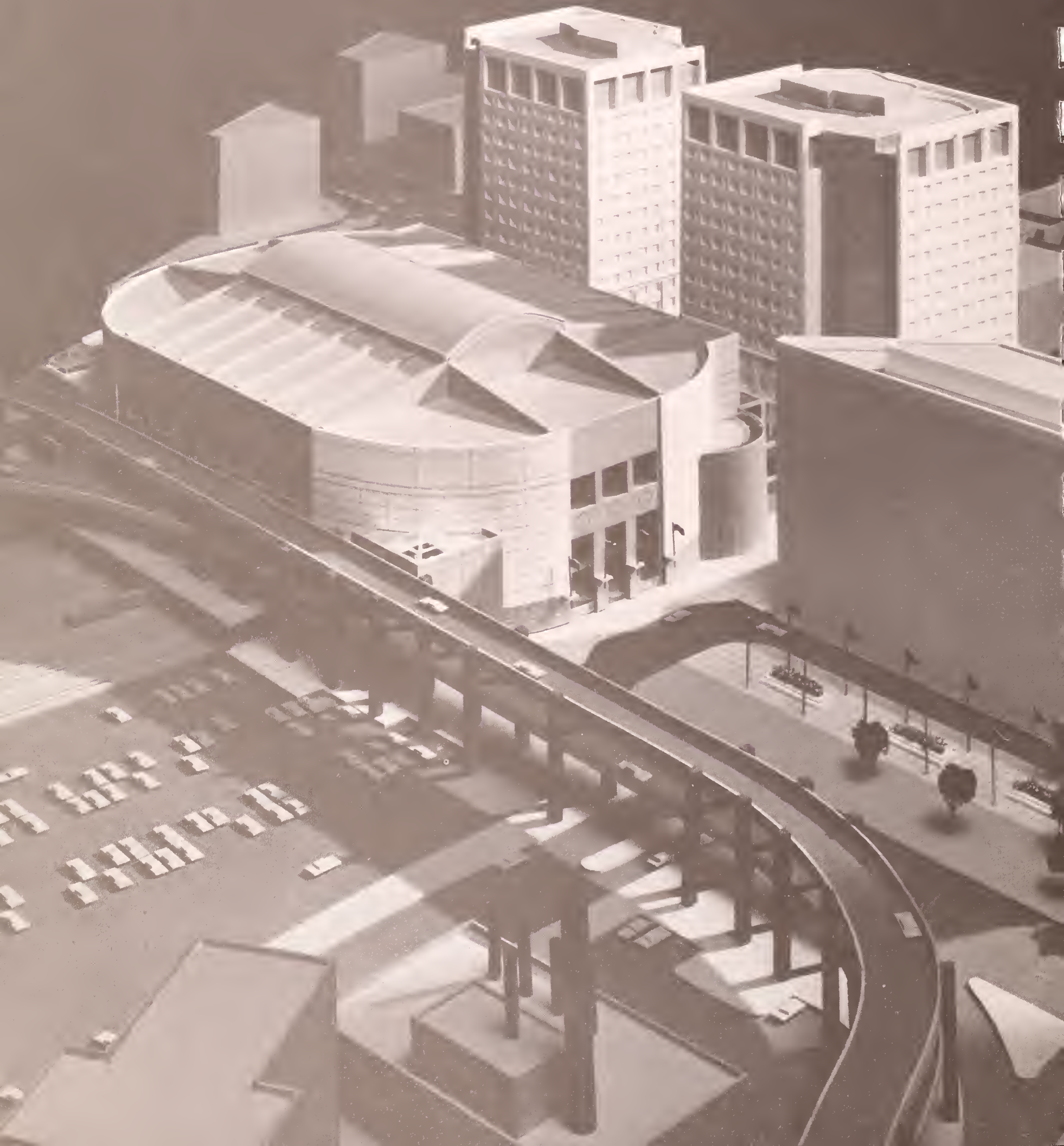
	North Station	Fort Point Channel/ South Station
POTENTIAL FOR MAXIMIZING OPERATING INCOME	Because of the air-rights condition, an arena will have higher operating costs (staff, electricity for escalators, railroad ventilation, etc.) It may be more difficult for the arena operator to capture ancillary restaurant income because the spectator has other options for spending.	An arena on this site will have lower building operation costs, greater potential net parking income, and a greater potential to capture more of patron's total food and beverage spending.
PROJECT MOMENTUM	North Station was the site proposed by the Arena Committee in 1981, and many in the private and public sector have already supported the choice of this site for a new arena.	Practically no momentum for this site exists as a result of the 1977 plan. A substantial public education/participation effort would have to be conducted.
TECHNICAL IMPLEMENTATION	Substantial coordination with MBTA design and construction required; design options for organization and structural concept are limited.	A great variety of design options exist, and there are fewer interagency dependencies.
ABILITY TO RETAIN EVENTS AND TENANTS	There is good potential for continuity of existing Garden tenants in new arena.	It is possible that some tenants and events currently in the Garden might not move immediately to a new arena. the However, a new building could be viable with only one major sports franchise. It is likely, however, that both sports franchises would ultimately relocate to the new arena.

Recommended Site

On the basis of the above analysis, the Study Team found that both sites are technically feasible and would be good locations for a new arena. However, good site access at Fort Point Channel is dependent upon major transportation improvement projects which have not yet been approved or implemented. These uncertainties lead the Study Team to recommend that the North Station site be carried forward for detailed analysis during the second phase of the feasibility study.

DESIGN CONCEPT FOR A NEW ARENA

7



DESIGN CONCEPT FOR A NEW ARENA

7

SUMMARY OF WORK PERFORMED

At the conclusion of the first phase of the Feasibility Study, the decision was made to proceed with the development of a new arena design concept for North Station for purposes of comparison to a renovated Boston Garden. The design concept described and illustrated in this chapter developed from further analysis of the building program and the specific site constraints. The arena design concept and an outline specification were developed to a level of detail sufficient for cost estimating purposes. This chapter describes the specific features of the arena itself, and the following chapter on urban design issues elaborates on the arena's contextual situation.

CONCEPT SUMMARY

The design for a new arena at the North Station site emphasizes superior seating, unobstructed sightlines, ease of spectator circulation and provision of amenities for event patrons. The proposed design includes state-of-the-art support facilities and arena service functions for staff and performers. Drawings and model photographs illustrating the proposed new arena concept are presented at the end of this chapter.

Despite severe site constraints, the proposed new arena design incorporates a modern structural system and seat layout which can offer comfortable seating dimensions and aisle widths as well as unobstructed sightlines for the full variety of events which take place in a modern arena. The design concept has no overhanging balconies or columns which result in obstructed view seats. Through an efficient circulation pattern within the proposed arena, more seats can be incorporated within the limited site boundaries than was possible in older arena design solutions.

Arena patrons reach their seats in the proposed facility directly from a concourse which circles the entire arena and is used only for patron circulation and amenities.

This spectator concourse provides an efficient pattern of circulation and eliminates the need for cross aisles, thus affording more area for seating. Spectators reach the concourse from ramps or escalators located at the southeast and southwest corners of the arena. The ramps and escalators take spectators directly to the concourse. On the south side of the arena, the concourse overlooks the skylit train station Galleria and gives an open and light character to patron spaces. This openness in design of the major circulation elements serves to orient patrons as they move in and out of the building. Additional vertical circulation elements are located at the northeast and northwest corners of the building for spectator convenience and safety.

Arena support and service functions in the proposed design are entirely separated from spectator spaces. Performers, athletes, and staff will enter the building through a separate entry on the west side of the building. Offices, dressing rooms, and locker rooms are located at the mezzanine level on the west side of the building. The function of these support spaces is different from other arena spaces, and the west elevation of the building reflects this difference in its materials and scale of architectural elements appropriate to the functions within the building.

The design concept for the new arena thus incorporates contemporary design concepts and construction techniques into the design of a facility which responds to its severe site constraints and provides a superior new facility.

LOBBY AND CONCOURSE

Spectator Flow

Arena spectators will enter the arena from several locations within the Galleria. Ticket taking and turnstiles will be located at the southeast and southwest corners of the arena in the Galleria space. Patrons will enter circular ramps or one of four escalators located at these points and move directly up to the main arena concourse.

The northwest stair tower along the new pedestrian spine could be used as an auxiliary entry for special events. Patrons would move directly from the ticket taking/turnstile location at grade to stairs which lead to the main concourse. If found desirable, a direct upper level connection could be built between this stair tower and eventual development built to the north of the expressway ramps.

A ticket sales lobby and box office for purchase of tickets at event time is located adjacent to the main arena entry points at grade level in the Galleria. This box office fronts both directly on the exterior of the building as well as on the Galleria.

Vertical Circulation

Patrons will circulate vertically to the concourse through the ramps at the southeast and southwest corners of the arena or on pairs of escalators which are accessible from the Galleria. The four escalators will be able to move the main portion of spectators vertically to the restaurant and bar mezzanine level and to the main concourse level above.

Elevators are available to handicapped patrons and those patrons with special requirements at the southeast and southwest entry points to the arena. These elevators, directly accessible from the Galleria, serve all public levels of the arena. All of the vertical circulation elements have been designed to facilitate the spectator's orientation, sense of well-being and safety.

Exits

Spectators will leave the arena house through vomitories evenly spaced around the building. After moving through the concourse, spectators will use the ramps or escalators on the Galleria (south) side of the arena or through the stairs on the north side of the building.

Concourse Design

The concourse is a minimum of 20 feet wide and runs continuously around the arena, providing access to spectator seating at all points. It is visually open to the Galleria space which orients the patron. Finishes will be light colored and of durable quality giving the concourse a lively and clean appearance.

Concessions

Concession locations are built into the exterior of the concourse. This guarantees maximum visibility for patrons coming from the vomitories. Portable stands for vending of programs and souvenirs will be located on the south side of the arena on the main concourse. Additional concession areas are located on the mezzanine, directly accessible from the concourse.

SPECTATOR SPACES

Event Seating

The preliminary design concept for arena house seating calls for the following maximum seating quantities in configurations for:

Hockey: 16,588
Basketball: 17,311
Concerts (center stage): 18,151

Other event types fall generally within one of these seating configurations.

Fixed Seating Tiers

The depth of seating tiers will meet or exceed industry standard of 31". The length of rows will conform to state building code requirements which limit rows to 15 seats. The width of seats will be 19" to 21" with an average of 20".

Arm chair construction will include back and seats of one-piece molded, double wall, high density plastic; hinge mechanism to be enclosed self lubricating; arm rest design of same material as standards or molded plastic; all metal parts to have smooth enamel electrostatically deposited and oven-baked finish. Seating will be complete with an easily understood aisle and seat numbering system.

Concourse-level Suites

Suites will be located at the concourse level of the arena and will be directly accessible from the concourse. Each suite will have a lounge area, utilities and T.V., as well as ample fixed seating. Suites can be finished to the specifications of each lessor. The seating provided in suites will be 24" wide with padded and upholstered seats and backs. Additional moveable chairs will be provided by suite owners. Rough plumbing will be provided for toilets, to be installed at the owner's option.

Handicapped Seating

Locations for handicapped seating are directly off the main concourse around the arena perimeter. This will offer a full range of viewing positions to wheelchair patrons. The number of wheelchair viewing locations will meet or exceed code requirements.

Temporary Seating

Folding chairs will be provided for temporary seating arrangements for basketball and other events which require that arena floor seating be set up. Seating tiers will be electrically operated retractable chair platforms with plastic, automatic folding chairs with arms and removable side railings which fold with the platform.

Sightlines

Seats are laid out parallel to dasher boards both at the sides and at the ends of the arena in order to minimize viewing distances and to maximize the number of seats at the sides of the arena with the best sightlines. Viewing distance measured horizontally from the center of the arena is 145 feet to the back row of seats at the sides of the arena and 200 feet to the last row of seats at the ends of the arena.

PATRON AMENITIES

Public Toilets

Toilets for men and women patrons are located at the concourse and mezzanine levels around the perimeter of the building and directly accessible from vomitories serving all sections of spectator seating. Toilet rooms are designed with separate entry and exit openings using switch backs in order to eliminate doors and to facilitate patron flow.

Fixtures exceed the number required by state building codes and will include the following: water closets, urinals, lavatories, drinking fountains, paper towel dispensers and disposals, mirrors and shelves.

All toilet rooms will contain facilities for the handicapped to comply with state handicapped code requirements.

Public Telephones

Pay telephones for patrons will be located throughout the ground-level Galleria and arena concourse.

First Aid Room/Information

Located on the spectator concourse, the first aid/information room will be available for patrons during all events.

Graphics and Signage

In addition to illuminated exit signs and signage required by the state building code, a color coordinated system of graphics and directional signage will be designed to direct patrons through the building and to the various facilities in the spectator spaces.

Exterior kiosks will display posters, information on upcoming events, ticket pricing, operational procedures, etc. They will be designed so that the information displayed can be accessed by large numbers of pedestrians moving to and from the arena. Electronic alphanumeric display boards can provide information and advertising and will help to enliven the Galleria. Kiosks may be combined with other informational/environmental units such as site and directional signs, telephone banks, street furniture, and ticket booths.

Interior signing will identify seating levels, restrooms, offices, and other areas. A logical system of directional signage will include seating diagrams at all entry points. These will be followed up by consistent signage over all ramps, portals, and vomitories.

Concession Signing/Graphics: This portion of the signing shall be furnished by the concessionaire but will be coordinated with the total project signing system.

Environmental Graphics: Wall graphics and banners will be utilized to communicate information and to provide large areas of color and design variety. Especially meaningful would be the display of Celtics' and Bruins' banners and jerseys in the Galleria. This would be a very effective way to provide a sense of the continuity of the Garden tradition in a public space accessible to all.

Restaurant/Bar/Club

A public restaurant, club restaurant and bar will be provided on the mezzanine level of the arena for use during arena events as well as for public patronage at other times as deemed feasible. This complex can be independently accessed without the arena being open, and would be an important amenity for the train station and nearby development.

The bar and restaurants will be accessible from the ramp and escalator system directly off of the Galleria.

Kitchen functions and service to the restaurant and bar will be directly accessible to the arena service and loading dock areas at the arena floor level.

PERFORMER SPACES

Performer Circulation

Circulation for performers and athletes is physically separated from arena patrons. Performer access to the arena is through a separate entry on the west side of the bulding where drop-off space is available; valet parking could be provided at this location. Access for performers is also possible through the loading dock on the east side of the building. For those needing high security, it will be possible to drive vehicles into the building at the loading dock.

Performers and athletes will circulate vertically by elevator at the west entry to dressing and locker rooms at the arena floor level.

All performer circulation occurs in a corridor at the arena floor level which affords access to the floor at numerous points. This corridor is only used for access to the arena floor and performer support spaces and is not available to the public.

Vomitories are designed to return players, performers, referees and officials from their benches or stations on the arena floor to the dressing area with a minimum of contact with the public.

Medical and first-aid facilties for players will be accessible from both the arena floor and dressing areas.

Dressing and Locker Rooms

Home team locker rooms for hockey and basketball are located at the west end of the arena and will be furnished with dressing cubicles three feet wide with open fronts. The cubicles will be designed with top shelves, hanging rods and hooks and a bottom locker cabinet with a lock.

The visitors' dressing rooms will be designed in a similar manner and will be made available as dressing rooms for other types of contests and events.

Additional dressing rooms will be available for special event performers and will be provided with toilets and other basic fixtures such as shelves, hook hanging strips and mirrors.

There will be separate access to and from the arena floor for both home team and the visting team, with the dressing rooms isolated from each in order to protect the autonomy and safety of each team.

Backstage Facilities

A large staging area will be provided at the east end of the arena between the loading dock and the arena floor access vomitories.

Props and equipment for performances can be brought in on trailer trucks to the loading dock and taken directly to the staging area. Sufficient space will be provided for both props and the circulation of performers backstage from one vomitory to the other.

The roof structure is designed to receive circus rigging, loudspeakers, scenery, etc. Catwalks will be provided in the trusswork accessible to these points.

Access to the arena floor by performers and equipment will be principally through vomitories at the east and west ends of the arena. The vomitory on the east side provides access for performers and equipment from the east storage area.

Performance lighting and sound will be controlled from a concourse level control room located at the northeast corner of the arena. There will be full visibility of the entire arena area from this control room.

The arena will be provided with overhead supports to carry a divider curtain which will reduce the area of the arena when smaller audiences are anticipated. These supports will be located in various configurations to provide a number of different arena layouts to suit normally anticipated performance requirements. This will make it possible to provide stages or performances in the round, proscenium openings, thrust stage and simple closing off of a half or a quarter of the arena.

Operations

The main arena floor can be opened to its maximum capacity by retracting all the hockey seating forward of the bulkhead, and the concourse can be used as an exhibition area. Exhibit material would be brought directly into the building by truck and unloaded at the high-level truck docks.

Ushers

Lockers, dressing rooms, and a lounge area will be provided for ushers at the arena floor level and accessible from the west entry to the building.

ADMINISTRATION

Ticket Sales and Accounting

Individual ticket sales for current and future events will be handled at a box office accessible at ground level at the western side of the arena building.

Mail order tickets and season tickets will be handled in the main box office and accounting area. The entire box office area will be designed as a secure area with its own alarm system.

Administrative Offices

The arena's administrative offices are accessible through a separate grade-level entrance on the west end of the building. The designated area will be designed to accommodate Authority office requirements.

Security

A system of alarms and T.V. surveillance for the entire building will be supervised from a central office in the Administration area. The purpose of the security system will be to survey the building, maintain order during performances, protect performers, and to secure the entire building, including the administrative office area and box office.

Press

Press boxes are located at the concourse level. Interview rooms and the press lounge are at the arena floor level directly off of the corridor serving performer dressing rooms. The media will have direct access to press rooms from the concourse level press boxes by means of an internal stair not available to the public.

SERVICE

Maintenance

Shops will be provided for painting, carpentry, mechanical and electrical trades. Dressing rooms and toilets for the personnel of these trades will be provided.

Refuse will be manually collected and delivered to the loading dock area where it will be placed into a compactor and processed into containers for removal.

Storage

Storage space will be provided for arena set up equipment, hockey dasher and goal nets, basketball floor and backstops, indoor track, boxing ring, stages and platforms, etc., and the requisite space for the operation and maintenance of forklift moving equipment. The storage space will require a high ceiling. Stored equipment will be located so as to be easily received at the service area, stored and placed in use on the arena floor as expeditiously as possible.

Auxiliary storage space is available for the needs of temporary exhibits or shows. The storage space will be designed physically and mechanically to house animals for such events as the circus, horse shows or possibly the rodeo.

The ice re-surfacing machine will be stored in this location to optimize its accessibility to the arena floor. A storage area on the north side of the lower level will be available for general equipment.

Restaurant provisions will be delivered to the loading dock in the truck service area and brought to the restaurant store room.

Trucking and Loading

There are two truck docking areas to service the arena.

The main service area will be accessible by a two lane ramp to the arena floor level. Space will be provided for five trucks at a loading dock within the arena. A secondary truck dock is located at grade below the main dock and is connected to the arena floor and concourse levels by a freight elevator.

Access to the arena floor is provided by two portals from the service area end.

Building Envelope

The arena facades are designed to respond to adjacent development and to provide a strong identity for the building. Granite, concrete, metal panels, and glazing are employed to enliven the mass of the building and modulate its scale to harmonize with surrounding buildings. The roof structure, vertical circulation elements and Galleria are given special expressive qualities in contrast to the more simple expanses of the arena's facades.

STRUCTURAL SYSTEM

Foundations

As a result of bad soil conditions which are organic fill and clay with a blow count of 5 to 15 to a depth of ±80 feet, pile foundations are recommended. 80 ton piles will be ±80 feet long and rest on bedrock. Foundation loads will range from 870K for the roof column supports to 670k for the main bent supports.

Foundations are to be spaced in a grid which accomodates the planned railroad tracks, generally 40 feet center to center. Groundwater will be encountered within 10 feet below grade level.

Superstructure

The framing of the superstructure of the new arena will be concrete. Seating bents are spaced 28 feet center to center and are cast in place. Precast seating units span the bents.

Concourse floors are precast double T's or core slabs with topping. Transfer from the 28 foot bent grid to the 40 foot column grid is facilitated through deep girders spanning the columns and supporting the seating bents.

The arena floor is a 24 inch deep waffle slab with 6" ribs @ 36 inches center to center supported on a 40 foot column grid. The ice slab will be built up on this structural slab.

The Roof

The roof is a two-way truss system supported on eight columns. Two main trusses each span north-south and east-west and intersect each other in plan at the corners of the arena floor. The trusses have a maximum depth of 40 feet. The framing of the center bay, which covers the arena floor in plan, is raised to facilitate louvers for natural ventilation around its perimeter. Within this bay will be located a structural grid for rigging of the circus and other types of performances.

The infill framing between the roof trusses will be joist framing. Metal deck is used in the center bay with built up roofing. On the pitched perimeter bays a standing seam deck is resting on girts which in turn are supported by infill trusses. The girts provide the bracing system for the trusses and are spaced +4'-0 center to center.

MECHANICAL SYSTEMS

Heating

Two dual fuel (gas/oil) fired hot water boilers in the 12X10 BTUH output range, associated stacks, pumps and distribution piping to heating coils in air handling systems, perimeter radiation and unit heaters, will provide heating in appropriate arena spaces during winter months.

Cooling

Total chilled water refrigeration plant capacity for the new arena will be 1800 tons. Two 700-ton chillers for the arena proper and one 400-ton chiller for auxillary spaces will feed a common piping distribution loop. Associated pumps and piping to cooling coils in air handling units, outdoor mounted cooling towers will be provided.

Arena

The arena will be air-conditioned. Four (4) air handling units in the 95,000 - 100,000 CFM range with outdoor air intake louver and dampers, return air dampers, mixed air plenum, filters, heating and cooling coils, duct silencers and associated distribution ductwork, registers, diffusers, etc. will be provided. Air handling units shall have an economizer cycle and enthalpy controls. The high roof will incorporate a set of louvers with motorized dampers for relief air.

Ancillary Spaces

A multiplicity of air handling systems totalling approximately 125,000 CFM will serve the ancilliary areas by function to achieve energy conservation by running only the required number of fans.

Automatic Temperature Controls

The automatic temperature controls will be pneumatic or pneumatic-electronic at owner's option. Again, at owners option, a central control panel may be included. An energy management system is not applicable to densely populated areas such as sports arenas due to resultant high relative humidity conditions in the space.

Ice Making Plant

A 500-ton refrigeration plant utilizing freon to chill 100% glycol solution, as well as associated pumps, piping and cooling towers will be used in the new building.

Trackway Ventilation

Since the MBTA has committed to operation of the commuter rail trains by the push-pull method, diesel engines will not come under the arena. The required ventilation can be accomplished by forcing air into the east and west sides of the train platform area, with the open end at the north serving as the exhaust zone.

LIFE SAFETY ANALYSIS

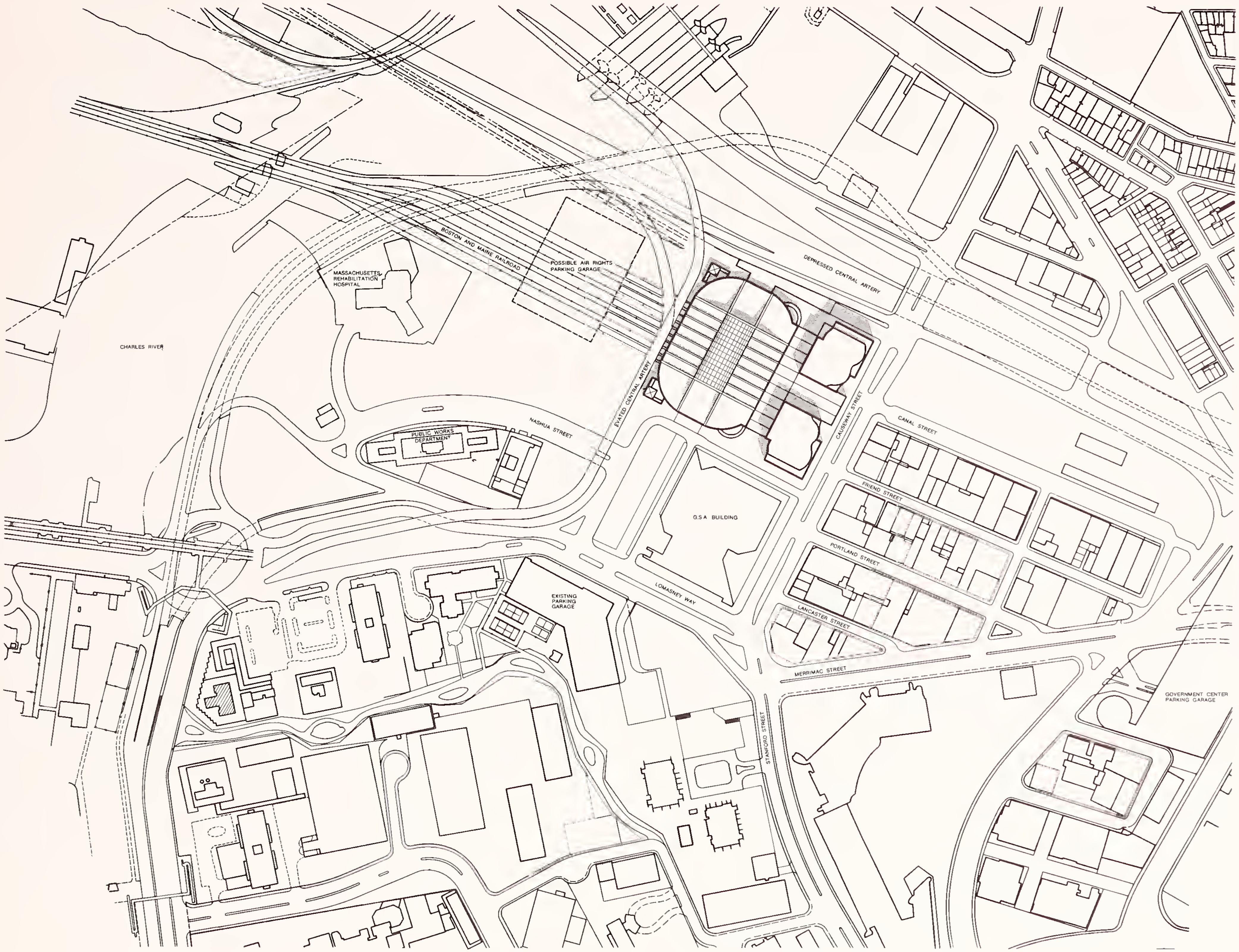
Multi-purpose arenas are unique structures. While the Commonwealth of Massachusetts Building Code has specific requirements for large assembly facilities, it is difficult to apply the code provisions to the new Boston Arena without substantial interpretation. Also, the code requirements will likely change over the next several years. With the large volume, very low combustible loading, and difficulty of fire spread typical of this kind of facility, the contemplated hazards are minimal. Therefore, several design features are usually acceptable with this type of facility, including:

- Exit design based on 15 minutes evacuation time instead of 150 persons per unit of width. The analysis in the Appendix details a 10.94 minute total evacuation time for the entire new arena.
- Permit an unprotected steel roof structure.
- Distribute exits around the facility in lieu of a main exit for 50% of the population.
- Exits, vertical and horizontal, to be open for ease of use and rapid flow.
- Aisles with dead ends greater than 20 feet.

The program will provide an adequate and reliable system to protect building occupants, fire fighting personnel, building contents, building structure and the continuity of building function. The fire and life safety program for the Boston Arena will be formulated to meet the intent of the Massachusetts Building Code to provide for the safety of the public. The program goals are to maximize the life safety, minimize property damage, and continue use of the facility. Design aspects which related to fire and life safety are:

- Construction of the building able to withstand the effects of a fire. Structural fire resistance will be matched to anticipated combustible loading.
- Detection of a fire will be accomplished by automatic and manual means - sprinkler water flow devices, smoke detectors, and manual stations.
- Alarm or occupant notification will primarily be through a public address system. Automatic alarms are not advisable for buildings with such a large seating capacity.
- Fire suppression will be automatic by various sprinkler systems and manual by fire fighters.
- Emergency power for detection, alarm systems, and egress lighting.

FIGURE 7-1


CHARLES RIVER
MASSACHUSETTS REHABILITATION HOSPITAL
BOSTON AND MAINE RAILROAD
POSSIBLE AIR RIGHTS PARKING GARAGE
DEPRESSED CENTRAL ARTERY
ELEVATED CENTRAL ARTERY
NASHUA STREET
PUBLIC WORKS DEPARTMENT
CAUSEWAY STREET
CANAL STREET
FRIEND STREET
PORTLAND STREET
LANCASTER STREET
G.S.A BUILDING
LOMASNEY WAY
EXISTING PARKING GARAGE
MERRIMAC STREET
STANFORD STREET
GOVERNMENT CENTER PARKING GARAGE

MULTI-PURPOSE ARENA
FEASIBILITY STUDY

MASSACHUSETTS
CONVENTION CENTER AUTHORITY

Howard Needles Tammen & Bergendoff

In Association With

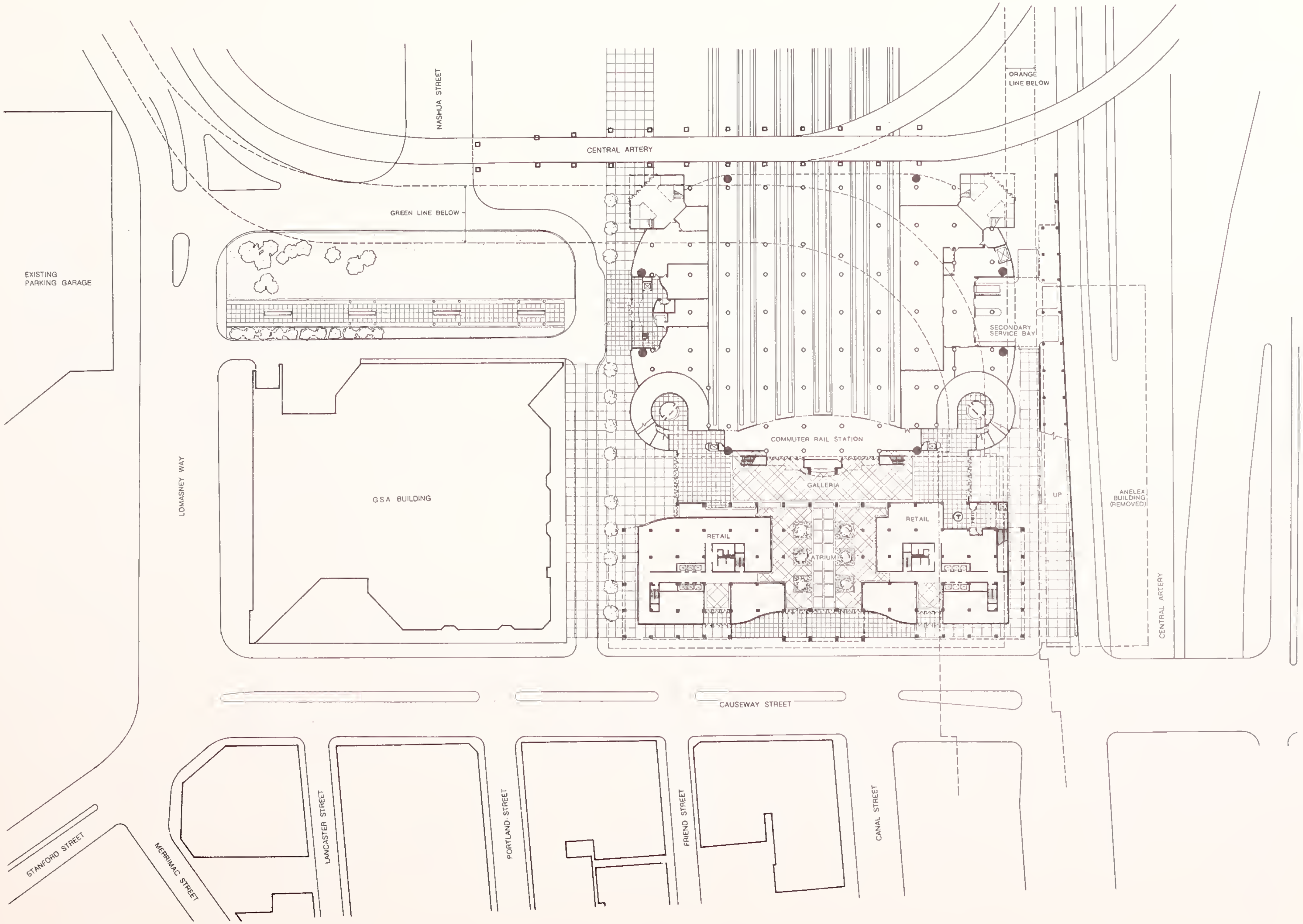
Touche Ross & Co
Gerger Group
Stull and Lee
Concordia Management Corp.
Ryan, Elliott and Company Inc.

NOVEMBER 1984

SITE PLAN

0
50
100
200

FIGURE 7–2


NASHUA STREET
CENTRAL ARTERY
ORANGE LINE BELOW
GREEN LINE BELOW
EXISTING PARKING GARAGE
SECONDARY SERVICE BAY
COMMUTER RAIL STATION
GALLERIA
RETAIL
ATRIUM
RETAIL
UP
ANELEX BUILDING (REMOVED)
CENTRAL ARTERY
GSA BUILDING
LOMASNEY WAY
CAUSEWAY STREET
STANFORD STREET
MERRIMAC STREET
LANCASTER STREET
PORTLAND STREET
FRIEND STREET
CANAL STREET
0
20
40
80

MULTI-PURPOSE ARENA
FEASIBILITY STUDY

MASSACHUSETTS
CONVENTION CENTER AUTHORITY

Howard Needles Tammen & Bergendoff

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Geiger Group
Stull and Lee
Concordia Management Corp
Ryan, Elliott and Company Inc

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SITE PLAN

FIGURE 7-3

MULTI-PURPOSE ARENA
FEASIBILITY STUDY

MASSACHUSETTS
CONVENTION CENTER AUTHORITY

Howard Needles Tammen & Bergendoff

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Ganger Group
Stull and Lee
Concordia Management Corp
Ryan Elliott and Company Inc

NOVEMBER 1984

GRADE LEVEL PLAN

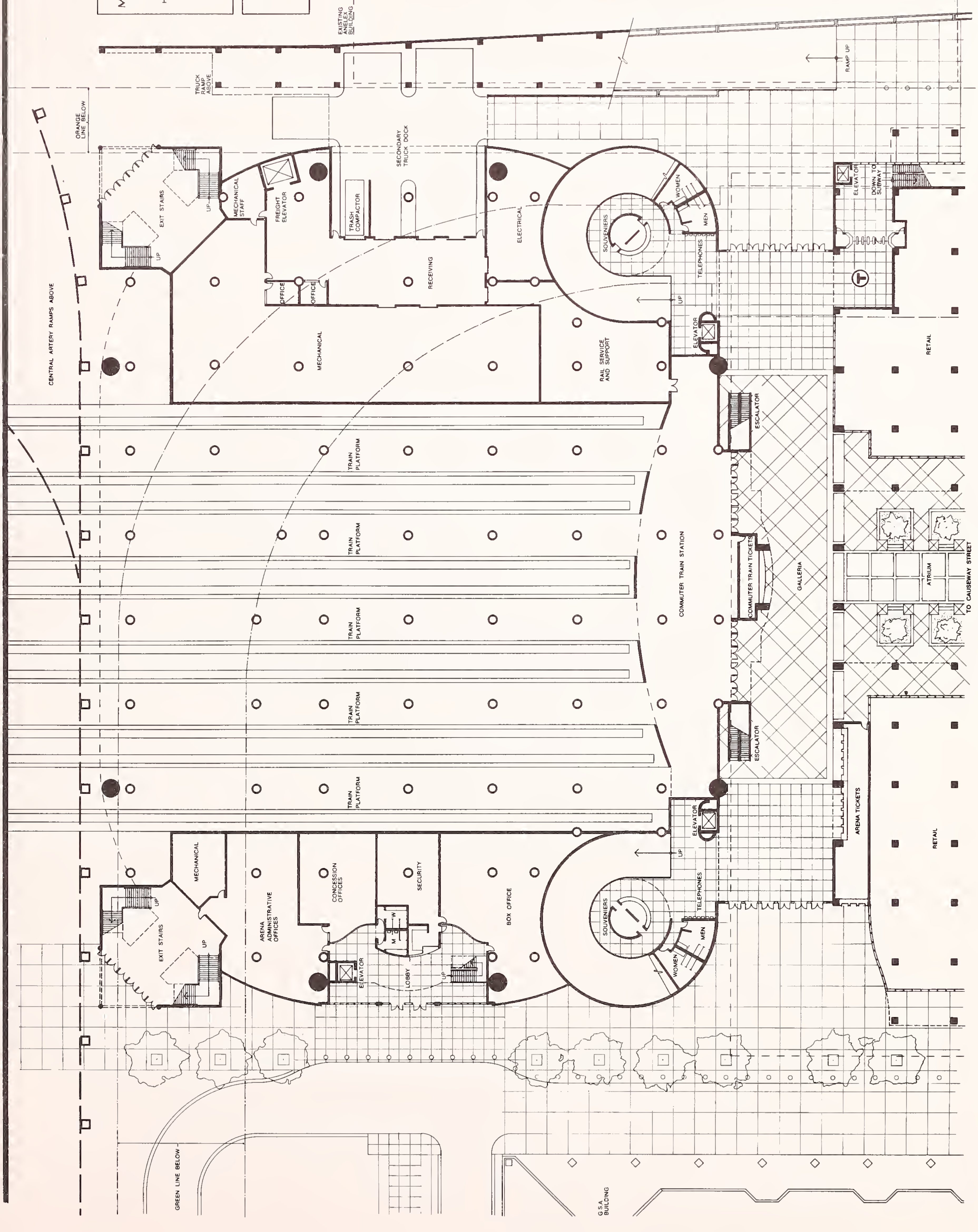
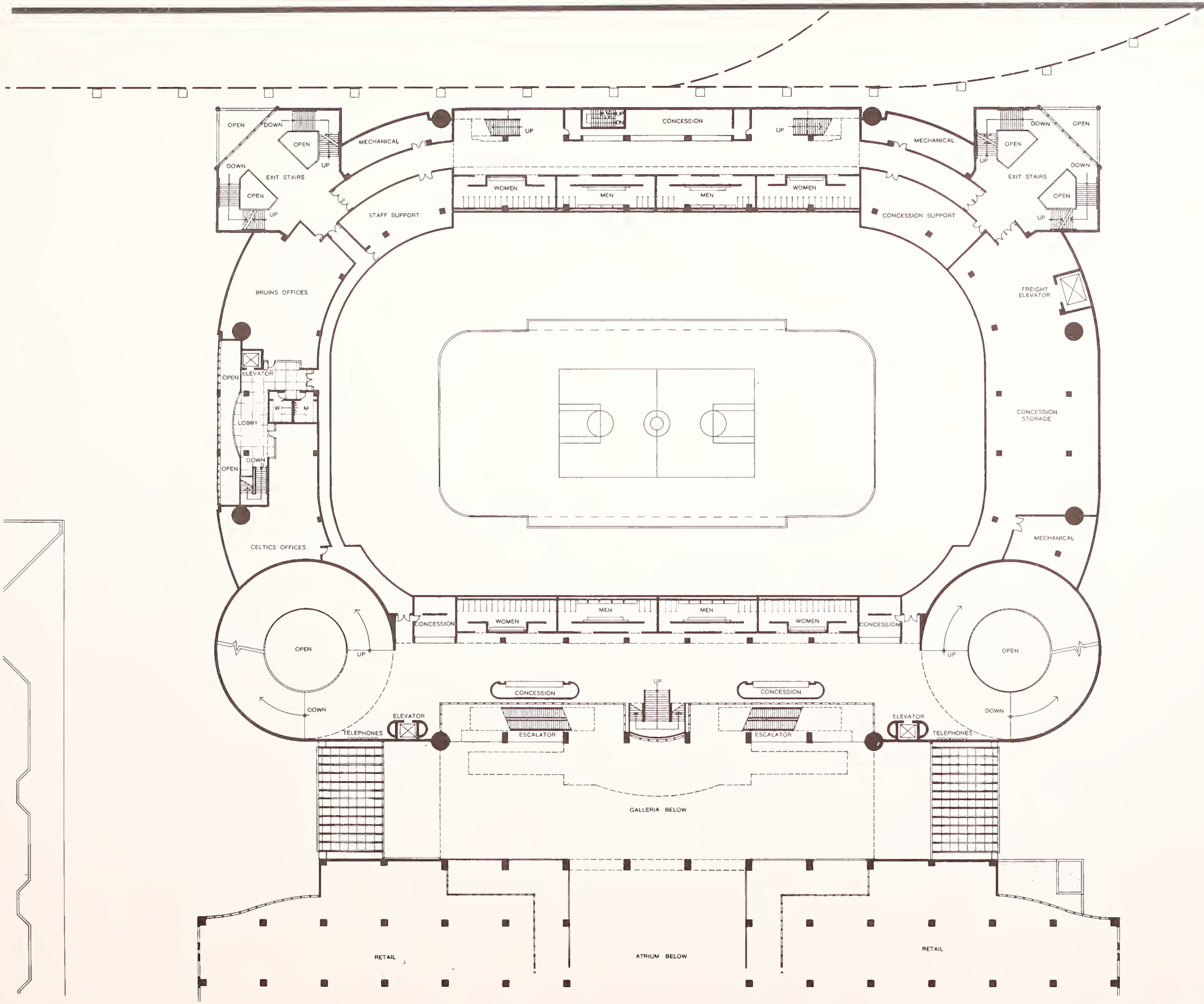

0
8
16
32
EXISTING ANELEX BUILDING
TRUCK RAMP ABOVE
ORANGE LINE BELOW
RAMP UP
SECONDARY TRUCK DOCK
MECHANICAL STAFF
FREIGHT ELEVATOR
TRASH COMPACTOR
EXIT STAIRS
UP
UP
ELECTRICAL
WOMEN
MEN
SOUVENIERS
TELEPHONES
ELEVATOR
DOWN TO SUBWAY
CENTRAL ARTERY RAMPS ABOVE
OFFICE
OFFICE
RECEIVING
MECHANICAL
RAIL SERVICE AND SUPPORT
UP
ELEVATOR
RETAIL
ESCALATOR
TRAIN PLATFORM
TRAIN PLATFORM
TRAIN PLATFORM
TRAIN PLATFORM
TRAIN PLATFORM
COMMUTER TRAIN STATION
COMMUTER TRAIN TICKETS
GALLERIA
ATRIUM
TO CAUSEWAY STREET
ESCALATOR
ARENA TICKETS
RETAIL
ELEVATOR
UP
MECHANICAL
EXIT STAIRS
UP
UP
ARENA ADMINISTRATIVE OFFICES
CONCESSION OFFICES
SECURITY
BOX OFFICE
W
M
ELEVATOR
LOBBY
UP
SOUVENIERS
TELEPHONES
MEN
WOMEN
GREEN LINE BELOW
G.S.A BUILDING

FIGURE 7-4


OPEN
DOWN
OPEN
DOWN
EXIT STAIRS
OPEN
UP
UP
MECHANICAL
STAFF SUPPORT
UP
CONCESSION
UP
WOMEN
MEN
MEN
WOMEN
MECHANICAL
CONCESSION SUPPORT
DOWN
OPEN
OPEN
UP
DOWN
EXIT STAIRS
OPEN
UP
BRUINS OFFICES
FREIGHT ELEVATOR
ELEVATOR
OPEN
W
M
LOBBY
DOWN
OPEN
CONCESSION STORAGE
CELTICS OFFICES
MECHANICAL
CONCESSION
MEN
MEN
WOMEN
WOMEN
CONCESSION
OPEN
UP
DOWN
UP
OPEN
UP
DOWN
CONCESSION
CONCESSION
ELEVATOR
TELEPHONES
ESCALATOR
ESCALATOR
ELEVATOR
TELEPHONES
GALLERIA BELOW
RETAIL
ATRIUM BELOW
RETAIL

MULTI-PURPOSE ARENA
FEASIBILITY STUDY

MASSACHUSETTS
CONVENTION CENTER AUTHORITY

Howard Needles Tammen & Bergendoff

In Association With

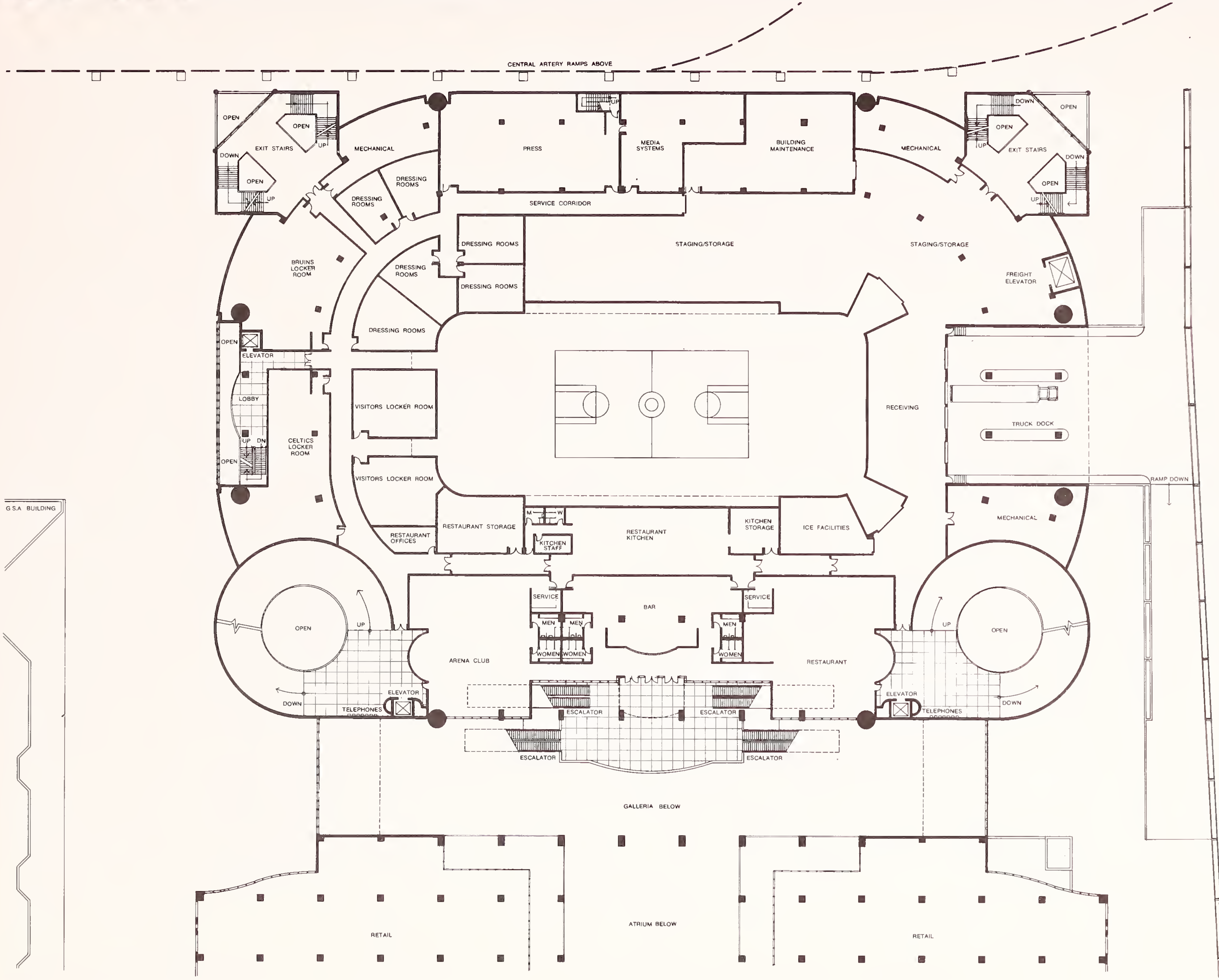
Touche Ross & Co
Geiger Group
Stull and Lee
Concordia Management Corp
Ryan Elliott and Company Inc

NOVEMBER 1984

ARENA MEZZANINE
LEVEL PLAN

0
8
16
32

FIGURE 7–5


CENTRAL ARTERY RAMPS ABOVE
OPEN
OPEN
EXIT STAIRS
DOWN
OPEN
UP
UP
MECHANICAL
PRESS
MEDIA SYSTEMS
BUILDING MAINTENANCE
MECHANICAL
DOWN
OPEN
OPEN
UP
EXIT STAIRS
DOWN
OPEN
UP
DRESSING ROOMS
DRESSING ROOMS
SERVICE CORRIDOR
DRESSING ROOMS
DRESSING ROOMS
DRESSING ROOMS
STAGING/STORAGE
STAGING/STORAGE
FREIGHT ELEVATOR
BRUINS LOCKER ROOM
DRESSING ROOMS
OPEN
ELEVATOR
LOBBY
UP
DN
OPEN
CELTICS LOCKER ROOM
VISITORS LOCKER ROOM
VISITORS LOCKER ROOM
RECEIVING
TRUCK DOCK
RAMP DOWN
G.S.A. BUILDING
RESTAURANT OFFICES
RESTAURANT STORAGE
M
W
KITCHEN STAFF
RESTAURANT KITCHEN
KITCHEN STORAGE
ICE FACILITIES
MECHANICAL
SERVICE
BAR
SERVICE
MEN
MEN
MEN
WOMEN
WOMEN
WOMEN
OPEN
UP
ARENA CLUB
RESTAURANT
UP
OPEN
DOWN
ELEVATOR
TELEPHONES
ESCALATOR
ESCALATOR
ELEVATOR
TELEPHONES
DOWN
ESCALATOR
ESCALATOR
GALLERIA BELOW
RETAIL
ATRIUM BELOW
RETAIL

MULTI-PURPOSE ARENA
FEASIBILITY STUDY

MASSACHUSETTS
CONVENTION CENTER AUTHORITY

Howard Needles Tammen & Bergendoff

In Association With

Touche Ross & Co
Geiger Group
Stull and Lee
Concordia Management Corp.
Ryan, Elliott and Company Inc.

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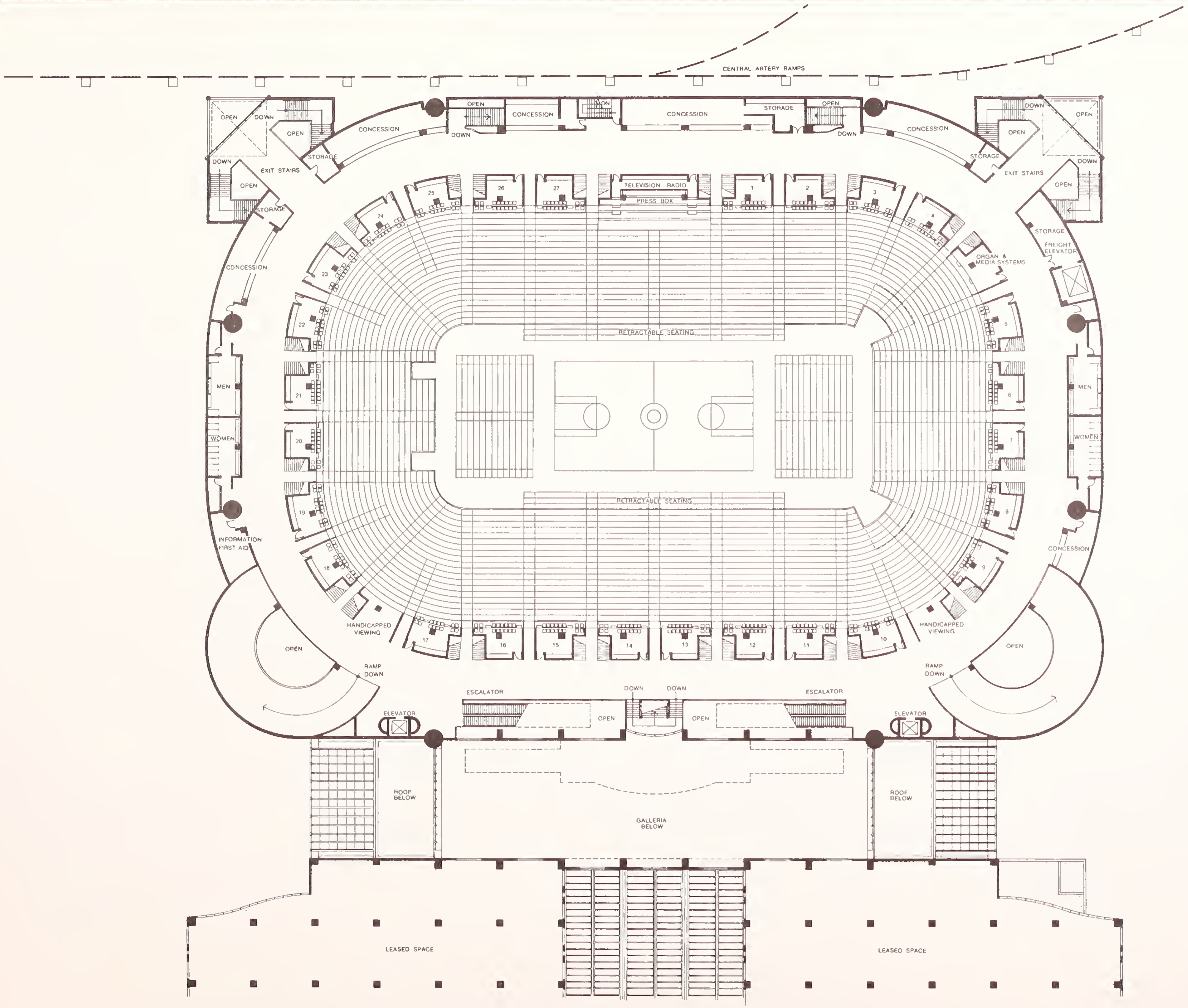
ARENA LEVEL PLAN

0 8 16 32

FIGURE 7-6


CENTRAL ARTERY RAMPS
OPEN
DOWN
CONCESSION
STORADE
STORAGE
EXIT STAIRS
TELEVISION RADIO
PRESS BOX
RETRACTABLE SEATING
ORGAN & MEDIA SYSTEMS
FREIGHT ELEVATOR
MEN
WOMEN
INFORMATION FIRST AID
HANDICAPPED VIEWING
RAMP DOWN
ESCALATOR
ELEVATOR
ROOF BELOW
GALLERIA BELOW
LEASED SPACE
LEASEO SPACE
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27

MULTI-PURPOSE ARENA
FEASIBILITY STUDY

MASSACHUSETTS
CONVENTION CENTER AUTHORITY

Howard Needles Tammen & Bergendoff

In Association With

Touche Ross & Co
Gerger Group
Stull and Lee
Concordia Management Corp
Ryan, Elliott and Company Inc

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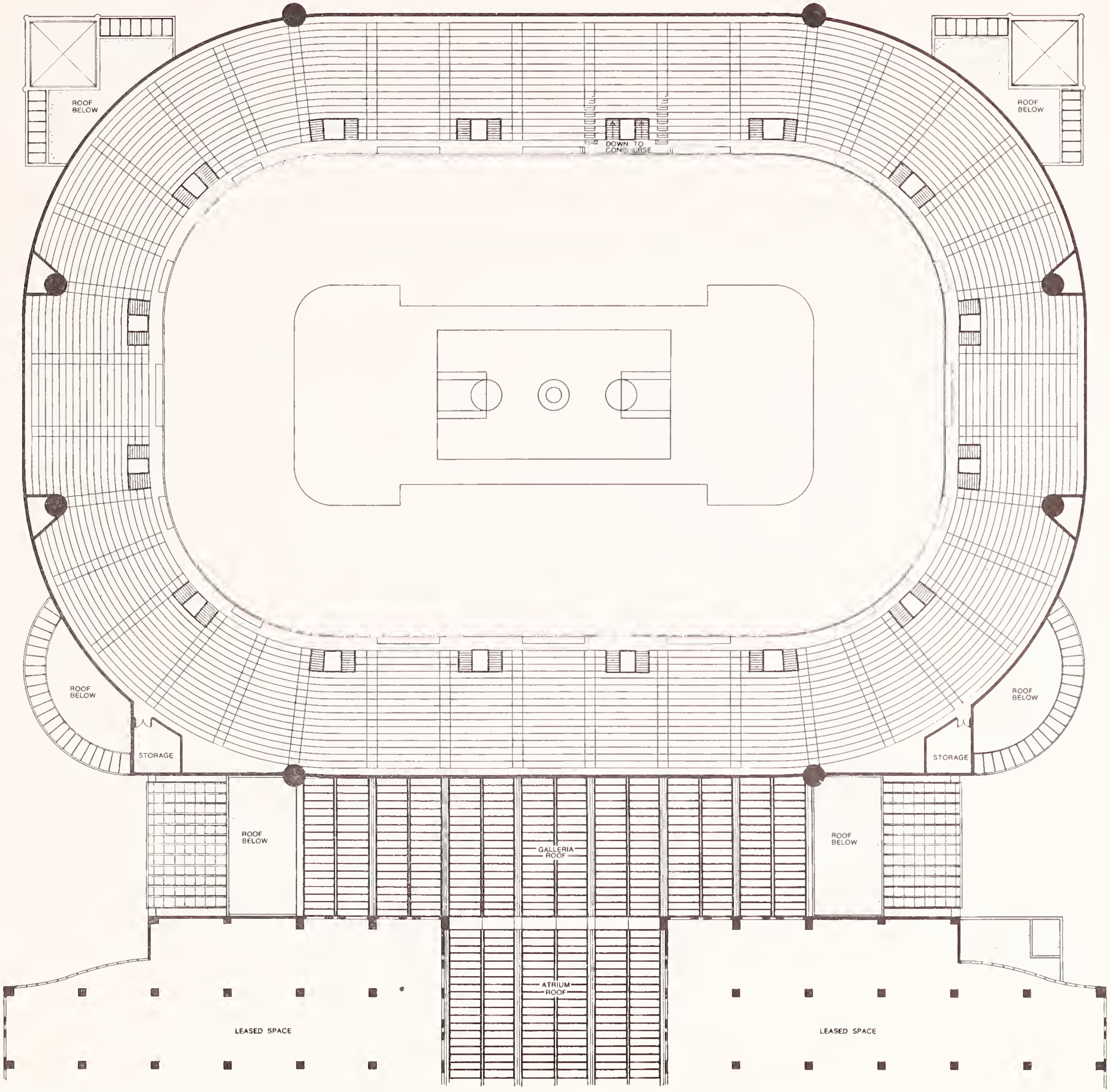
CONCOURSE LEVEL
PLAN

0 8 16 32

FIGURE 7-7


ROOF BELOW
ROOF BELOW
DOWN TO CONCOURSE
ROOF BELOW
ROOF BELOW
STORAGE
STORAGE
ROOF BELOW
GALLERIA ROOF
ROOF BELOW
ATRIUM ROOF
LEASED SPACE
LEASED SPACE

MULTI-PURPOSE ARENA
FEASIBILITY STUDY

MASSACHUSETTS
CONVENTION CENTER AUTHORITY

Howard Needles Tammen & Bergendoff

In Association With

Touche Ross & Co
Geiger Group
Stull and Lee
Concordia Management Corp
Ryan, Elliott and Company Inc

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UPPER LEVEL PLAN

0
8
16
32

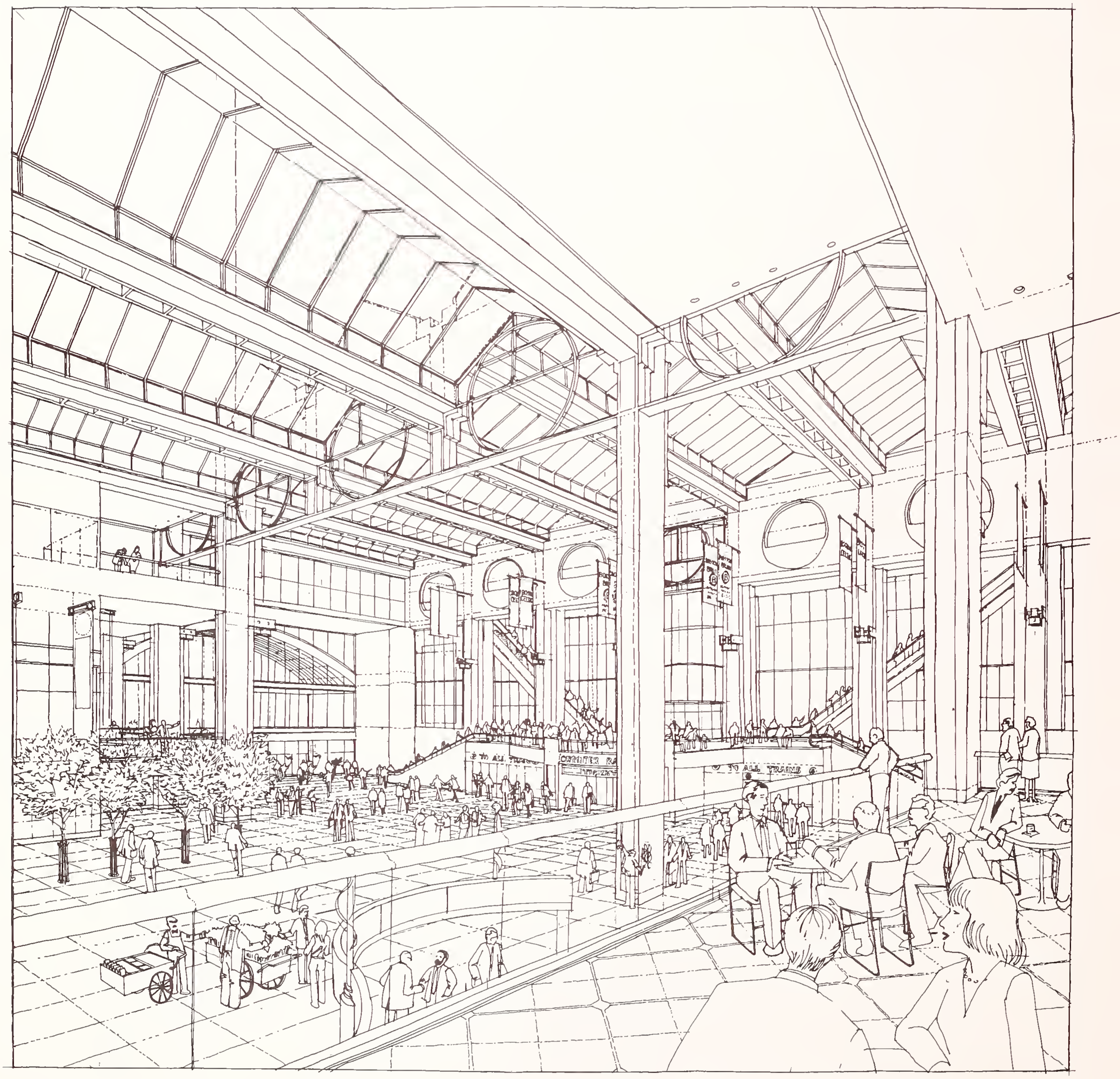
TO ALL TRAINS
COMMUTER RA
TO ALL TRAINS

FIGURE 7-9

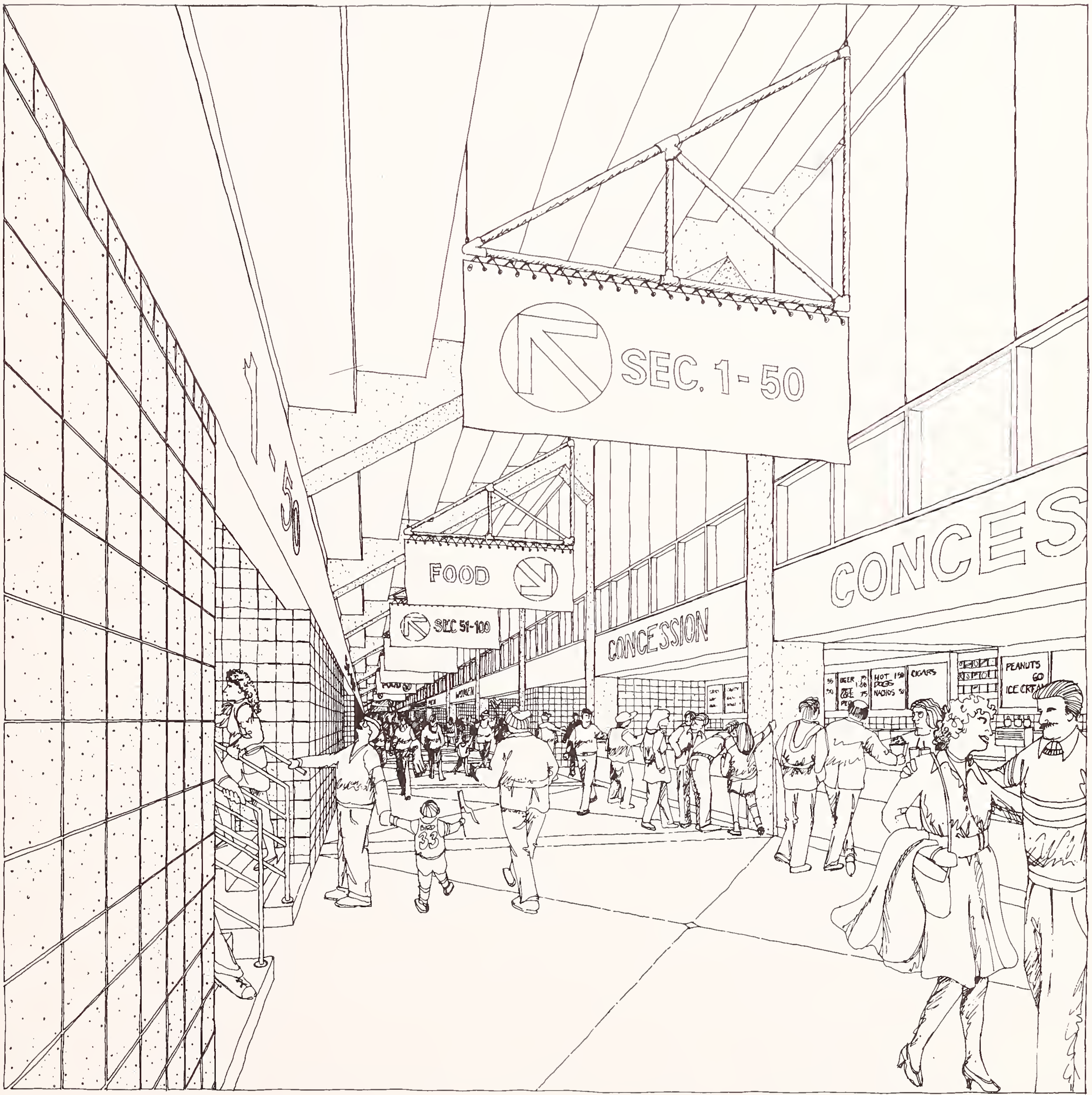
1-50
SEC. 1-50
FOOD
SEC 51-100
CONCESSION
CONCES
WOMEN
BEER
1.00
COKE 75
HOT 150
DOGS
NACHOS
CIGARS
PEANUTS
60
ICE CREAM
33

FIGURE 7–10

MULTI-PURPOSE ARENA
FEASIBILITY STUDY

MASSACHUSETTS
CONVENTION CENTER AUTHORITY

Howard Needles Tammen & Bergendoff

In Association With

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Geiger Group
Stull and Lee
Concordia Management Corp
Ryan, Elliott and Company Inc.

NOVEMBER 1984

SECTION THROUGH ARENA,
GALLERIA AND ATRIUM

0 8 16 32

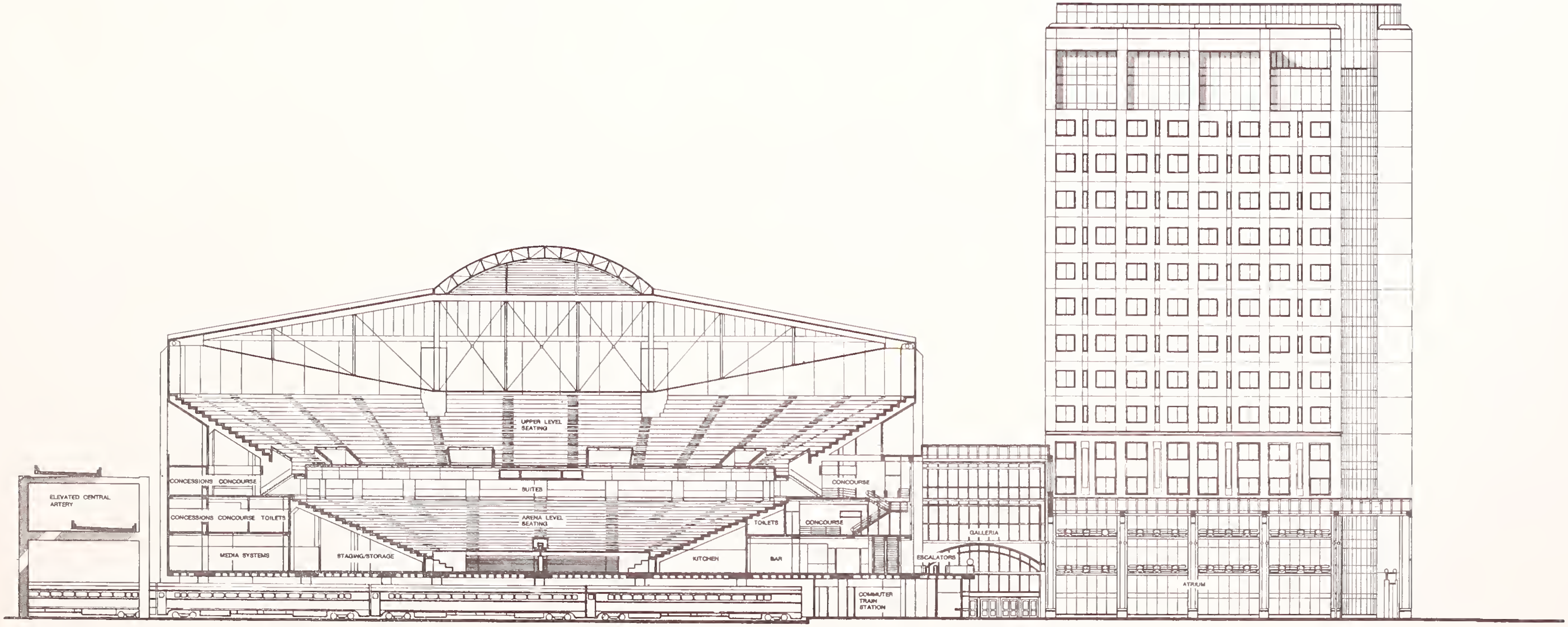

ELEVATED CENTRAL ARTERY
CONCESSIONS CONCOURSE
CONCESSIONS CONCOURSE TOILETS
MEDIA SYSTEMS
STAGING/STORAGE
UPPER LEVEL SEATING
SUITES
ARENA LEVEL SEATING
KITCHEN
TOILETS
BAR
CONCOURSE
CONCOURSE
COMMUTER TRAIN STATION
ESCALATORS
GALLERIA
ATRIUM

FIGURE 7-11

MULTI-PURPOSE ARENA
FEASIBILITY STUDY

MASSACHUSETTS
CONVENTION CENTER AUTHORITY

Howard Needles Tammen & Bergendoff

In Association With

Touche Ross & Co
Gerger Group
Stull and Lee
Concordia Management Corp.
Ryan, Elliott and Company Inc.

NOVEMBER 1984

SECTION
THROUGH ARENA

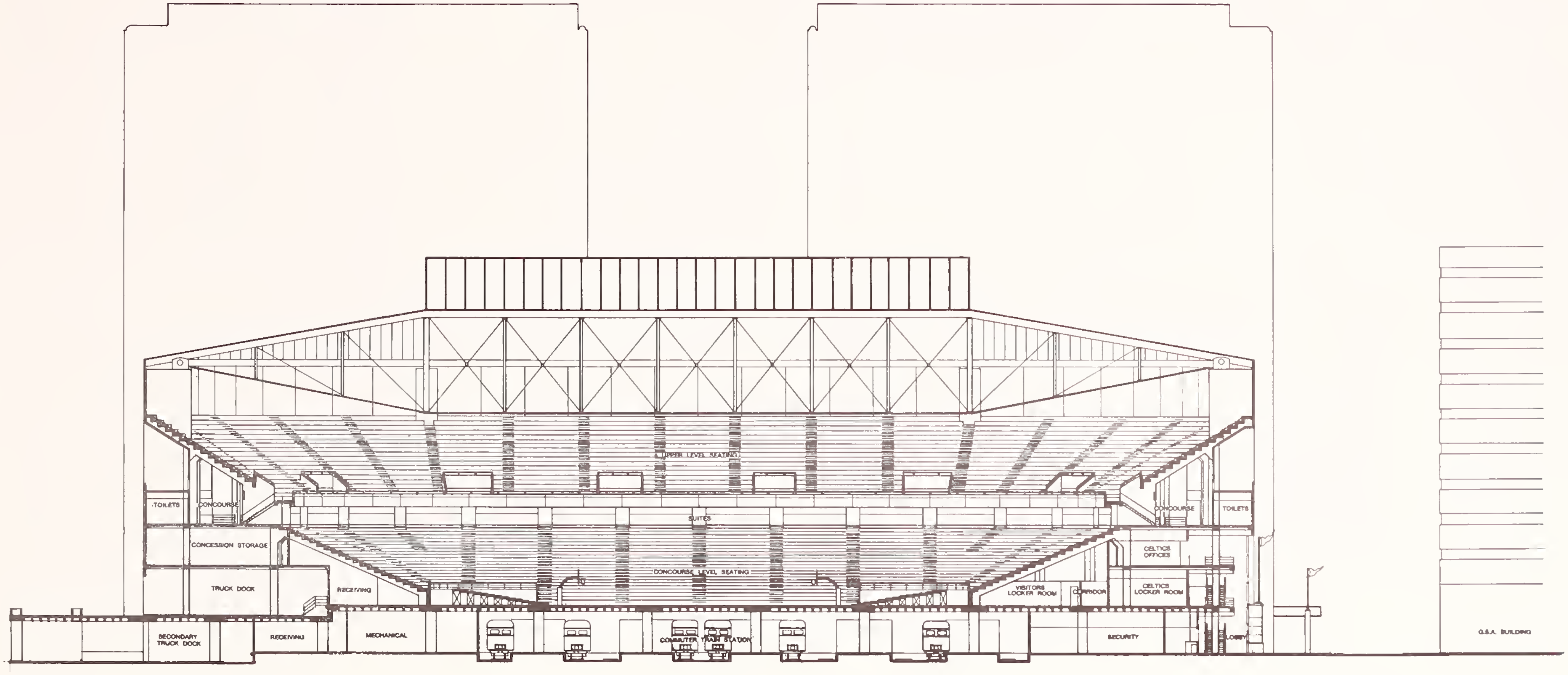
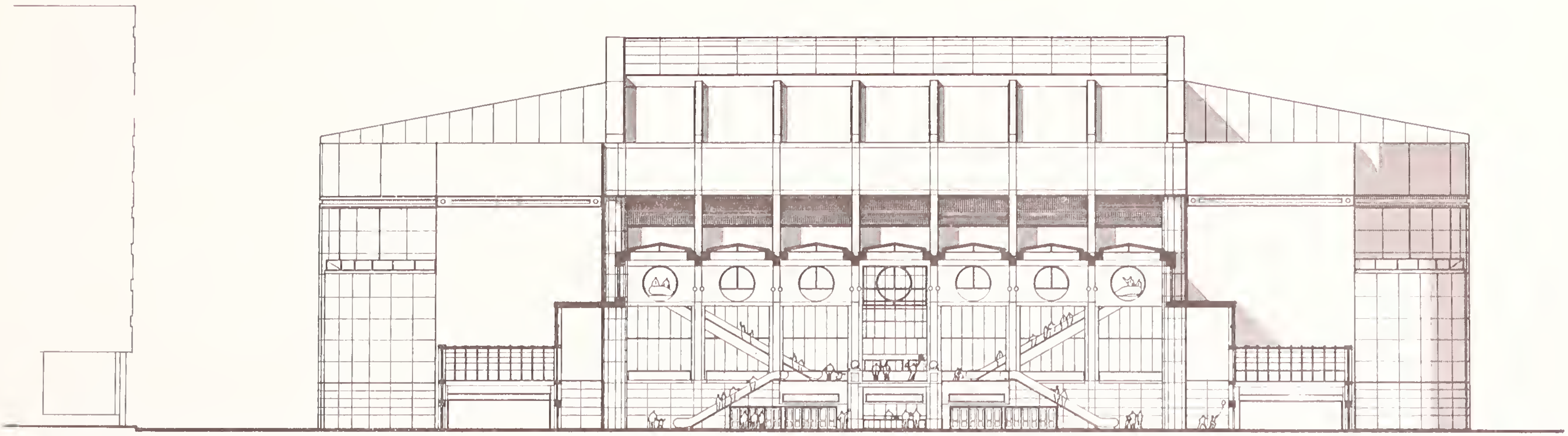
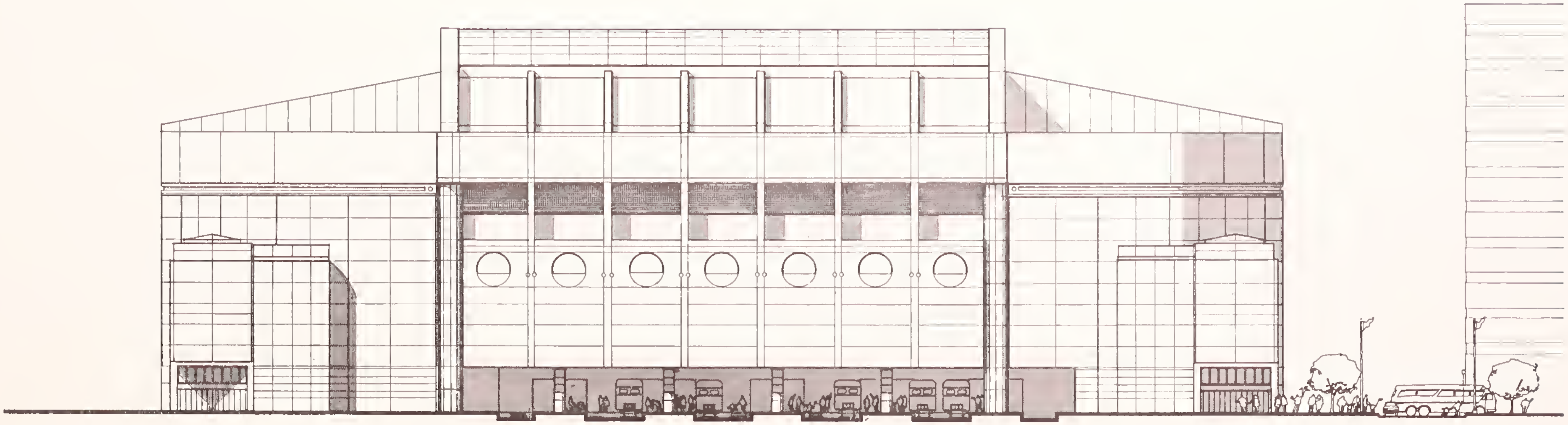

0 8 16 32
UPPER LEVEL SEATING
SUITES
CONCOURSE LEVEL SEATING
TOILETS
CONCOURSE
CONCESSION STORAGE
TRUCK DOCK
RECEIVING
SECONDARY TRUCK DOCK
RECEIVING
MECHANICAL
COMMUTER TRAIN STATION
VISITORS LOCKER ROOM
CORRIDOR
CELTICS OFFICES
CELTICS LOCKER ROOM
CONCOURSE
TOILETS
SECURITY
LOBBY
G.S.A. BUILDING

FIGURE 7–12





MULTI-PURPOSE ARENA
FEASIBILITY STUDY

MASSACHUSETTS
CONVENTION CENTER AUTHORITY

Howard Needles Tammen & Bergendoff

In Association With

Touche Ross & Co
Geiger Group
Stull and Lee
Concordia Management Corp
Ryan, Elliott and Company Inc

NOVEMBER 1984

SECTION THROUGH
GALLERIA

0 8 16 32

NORTH ELEVATION

FIGURE 7–13

MULTI-PURPOSE ARENA
FEASIBILITY STUDY

MASSACHUSETTS
CONVENTION CENTER AUTHORITY

Howard Needles Tammen & Bergendoff

In Association With

Touche Ross & Co.
Geiger Group
Stull and Lee
Concordia Management Corp.
Ryan, Elliott and Company Inc.

NOVEMBER 1984

EAST ELEVATION

0 8 16 32

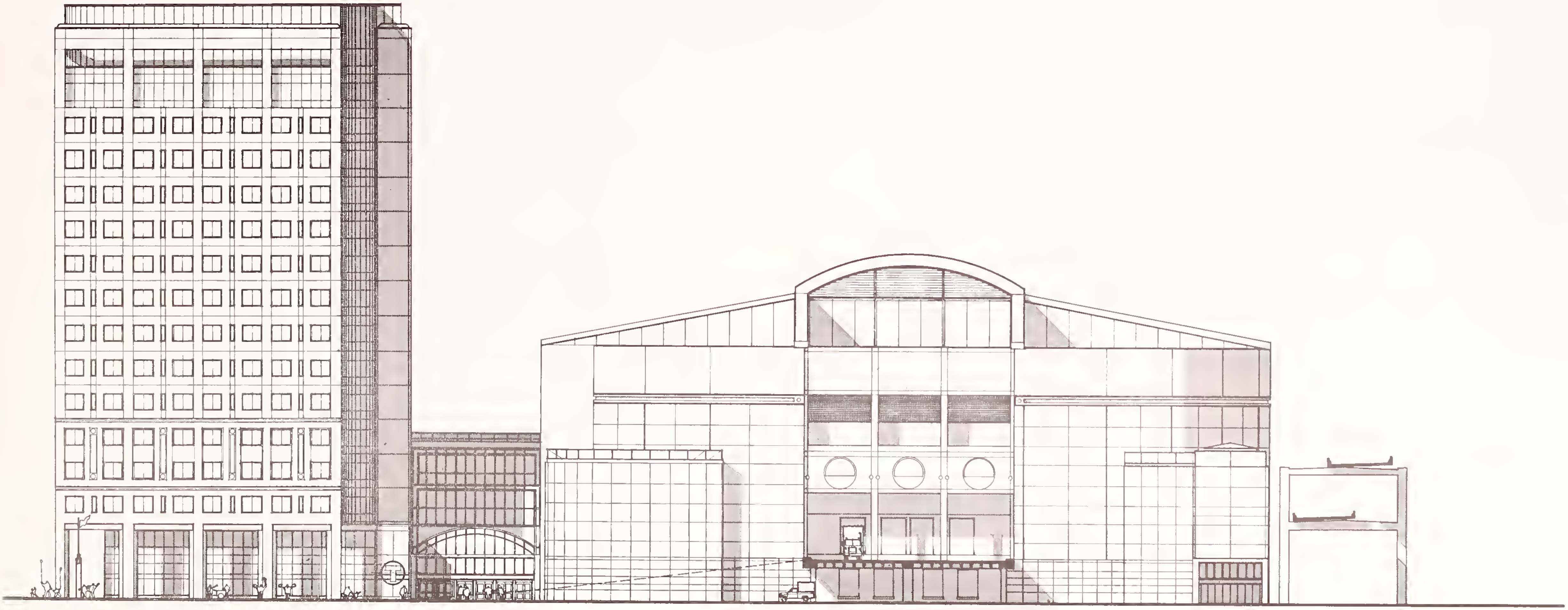


FIGURE 7–14

MULTI-PURPOSE ARENA
FEASIBILITY STUDY

MASSACHUSETTS
CONVENTION CENTER AUTHORITY

Howard Needles Tammen & Bergendoff

In Association With

Touche Ross & Co.
Geiger Group
Stull and Lee
Concordia Management Corp
Ryan, Elliott and Company Inc

NOVEMBER 1984

SOUTH ELEVATION

0 8 16 32

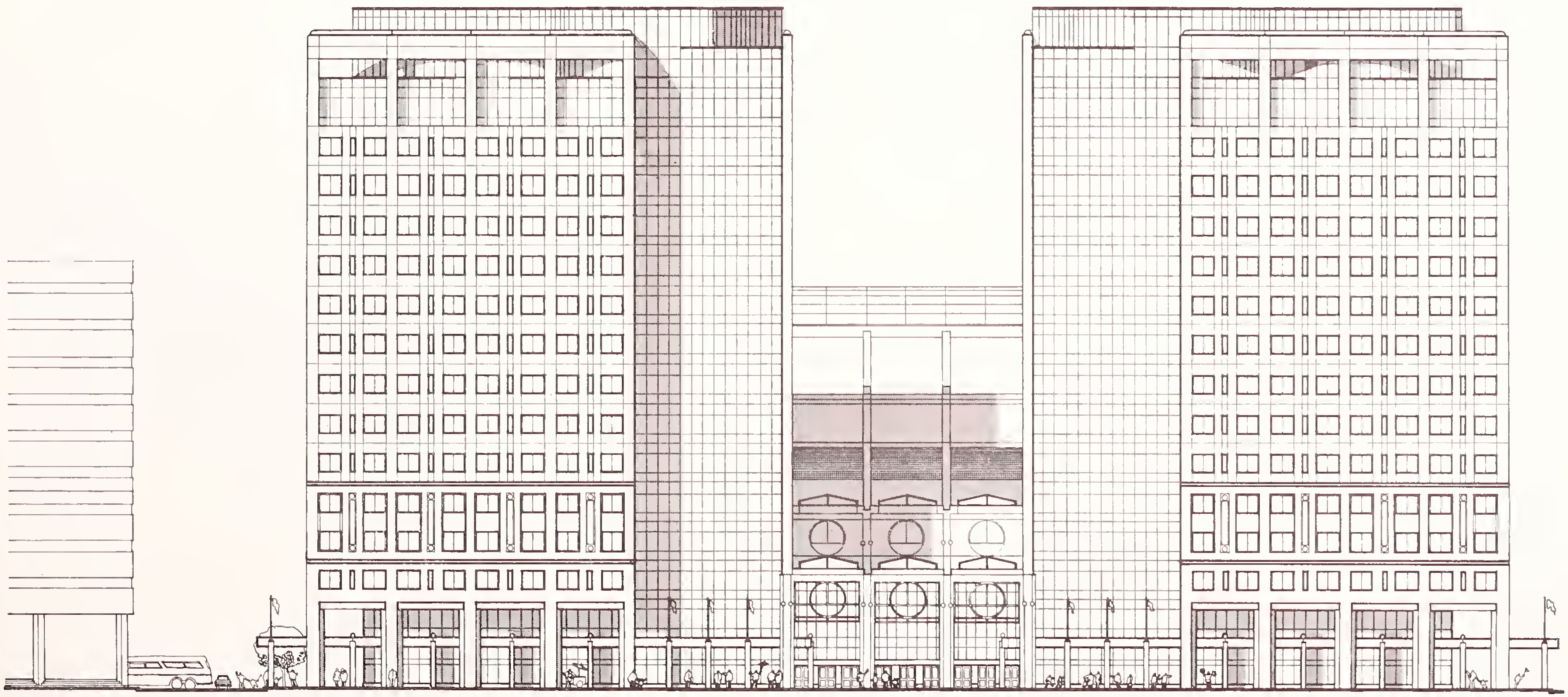


FIGURE 7-15

MULTI-PURPOSE ARENA
FEASIBILITY STUDY

MASSACHUSETTS
CONVENTION CENTER AUTHORITY

Howard Needles Tammen & Bergendoff

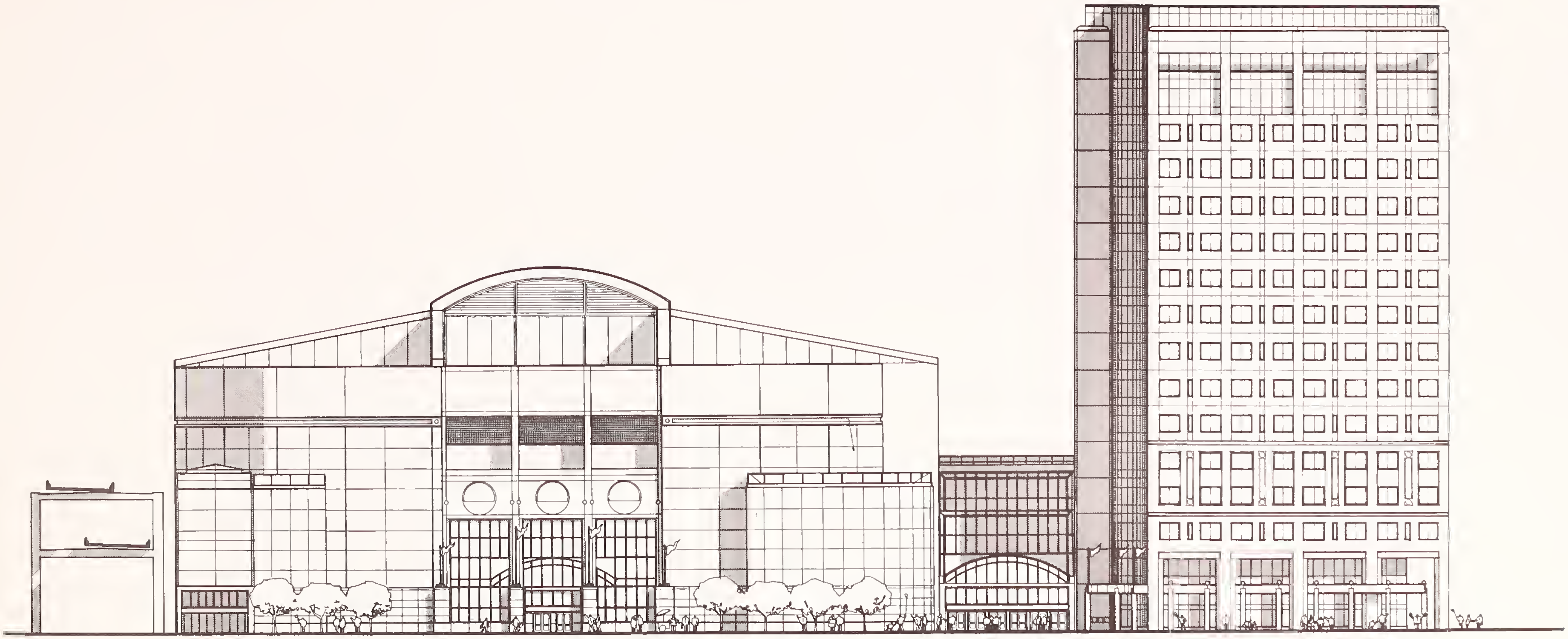
In Association With

Touche Ross & Co
Geiger Group
Stull and Lee
Concordia Management Corp
Ryan, Elliott and Company Inc

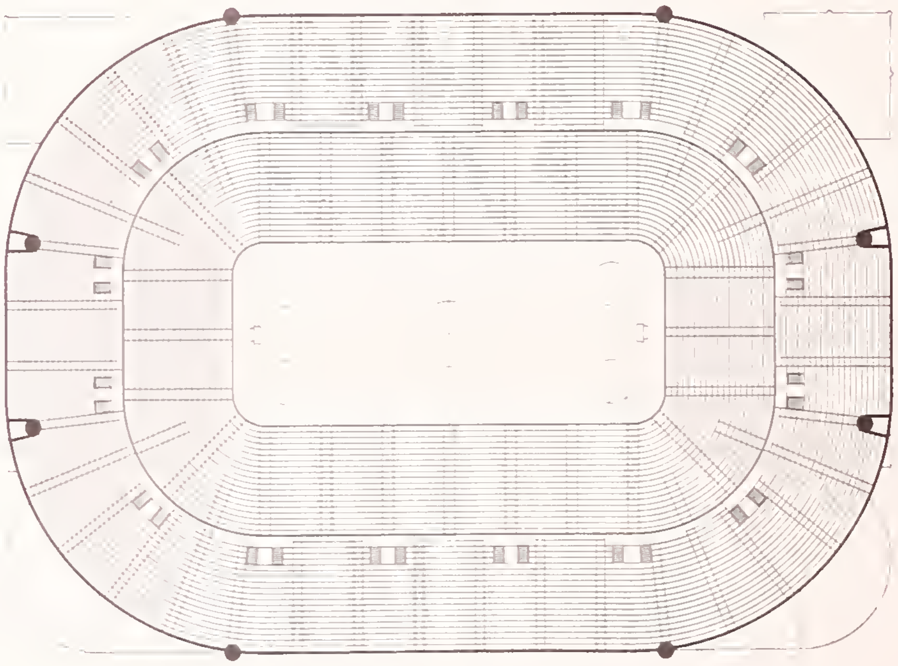
NOVEMBER 1984

WEST ELEVATION

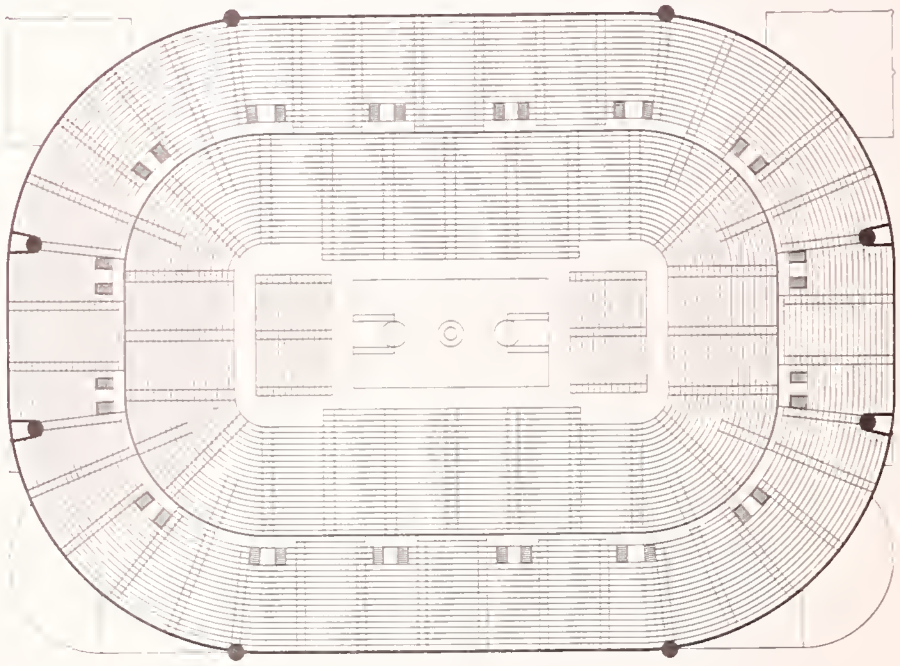
0 8 16 32



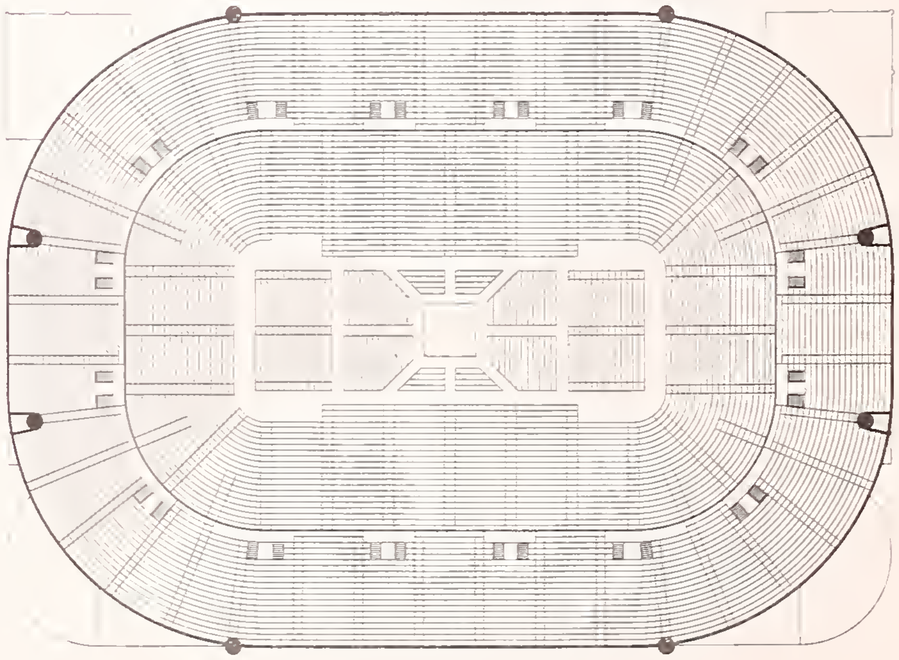
POTENTIAL ALTERNATIVE SEATING PLANS



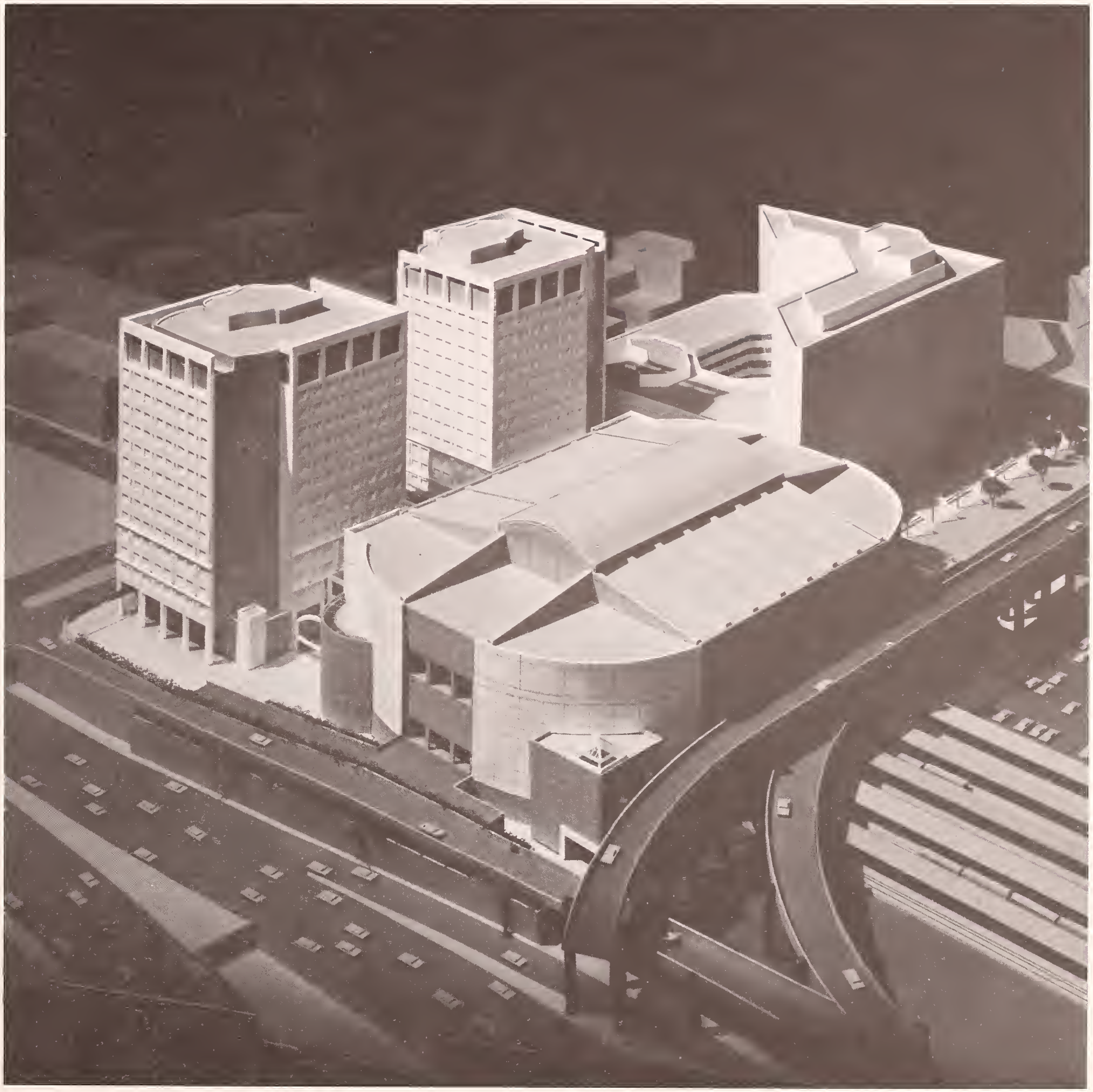
HOCKEY
16,583 SEATS

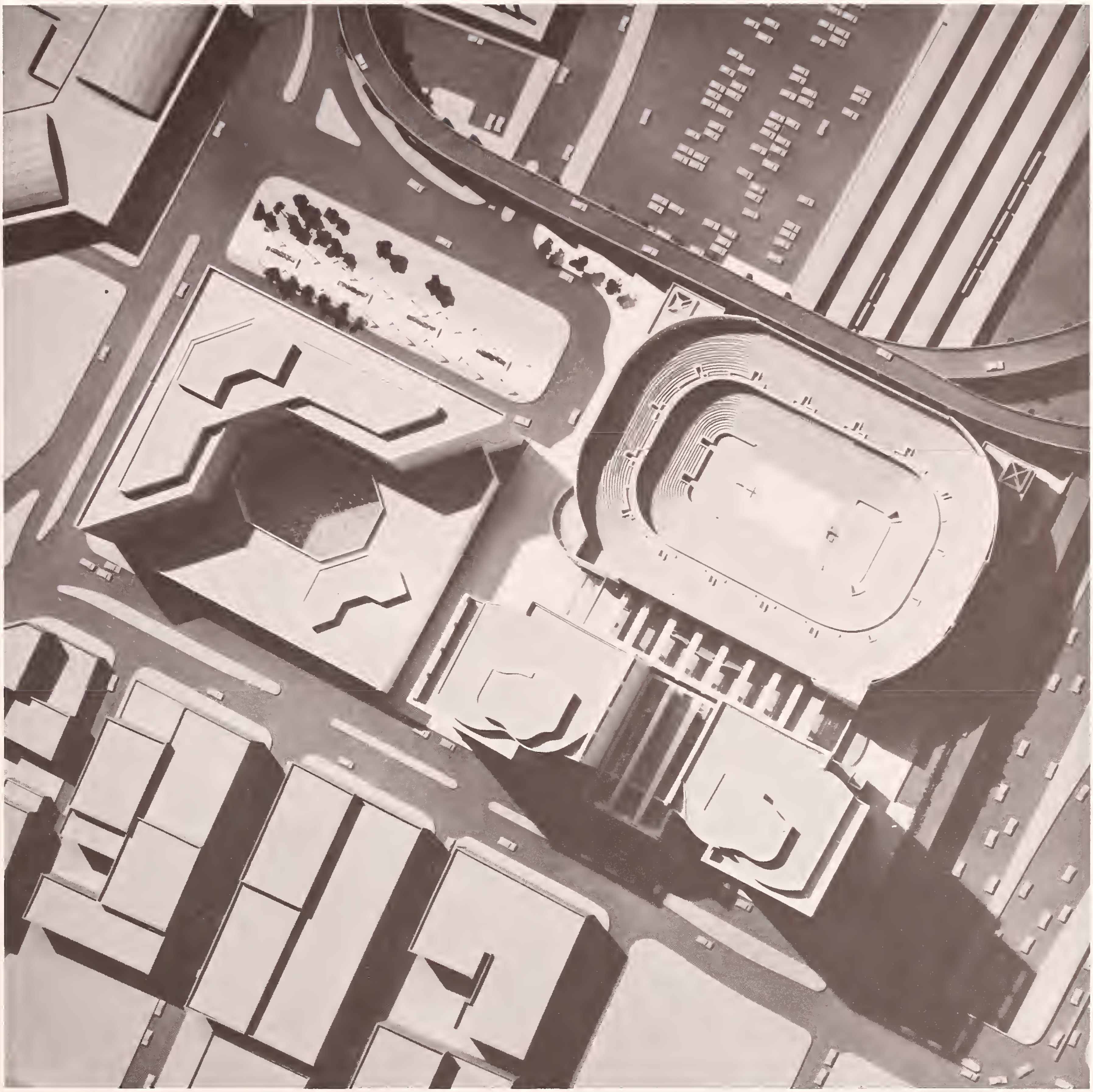


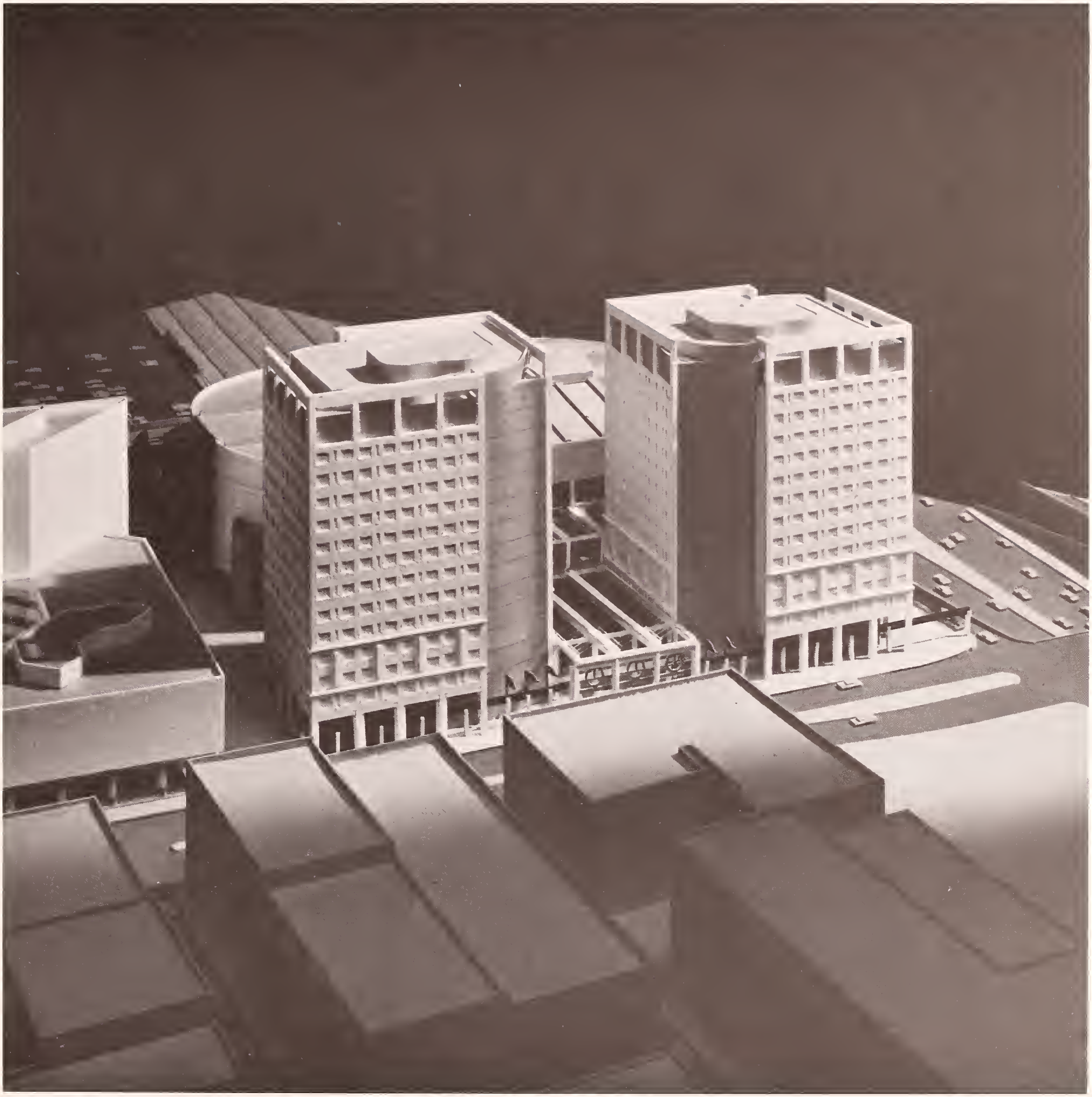
BASKETBALL
17,311 SEATS



CENTER STAGE CONCERTS
18,151 SEATS







URBAN DESIGN GUIDELINES AND ENVIRONMENTAL IMPACTS

8

URBAN DESIGN GUIDELINES AND ENVIRONMENTAL IMPACTS

8

SUMMARY OF WORK PERFORMED

This chapter documents a continuation of the site analysis process which had begun during Phase I of the Feasibility Study. In addition, this chapter describes an approach to urban design to be used in implementing the arena design beyond the proposed schematic concept documented in this report.

The Study Team conducted a detailed analysis of those contextual and urban design issues which affect and will be impacted by a new arena at North Station. Particular attention was focused on the relationship between major transportation projects and development opportunities as they relate to the new arena. Whereas the previous chapter focused on the arena proper, this chapter describes an approach to urban design issues concerned with the relationship of the arena to its immediate and nearby surroundings.

This chapter addresses the following major topics:

- Land Uses in the North Station Area
- Transportation, including Parking
- Urban Design Context

- Urban Design Issues and Opportunities
- Urban Design Guidelines
- Development Site Guidelines and Scenarios
- Environmental Impact Analysis

LAND USES IN THE NORTH STATION AREA

The Past: A Gateway to the City

The history of the North Station area is closely linked to changing transportation patterns and related land uses. During the 17th century much of the area was under water and was called the Mill Pond. Tidal canals were used to operate a saw mill at Dock Square and a grist mill near North Station. In the early 1800's, much of the area was filled and the Bulfinch Triangle street plan was implemented, while the canal was widened to provide access for goods between the Middlesex canal to the harbor at Dock Square. The highway across a causeway was widened and became Causeway Street. By 1850, four rail lines terminated near North Station, as the dominant mode of transportation shifted from ship to rail. When a City ordinance prevented trains from crossing Causeway Street, various terminals and mercantile buildings were constructed at the site.

The North Station complex was constructed in the late 1920's by the Boston and Maine Railroad as an ambitious mixed-use project which included 1) the sports arena (better known as the Boston Garden) and the rail station, 2) the Madison Hotel and 3) the Anelex office building. The Bulfinch Triangle area became largely a light manufacturing district providing employment for the neighboring residential areas, the West End, and North End. Traffic congestion was eased in the 1940's with construction of the Central Artery. Excellent transportation connections served the area with North Station providing commuter and long haul rail to points in the north, and the elevated Green Line providing transit connections to all other subway lines.

During the 1950-1970 urban renewal programs, areas surrounding North Station changed use from a mixture of residential and retail to the Charles River Park complex, an expanded Mass. General Hospital to the west, and Government Center to the south. In addition to declining rail traffic at North Station, the long period of redevelopment of the West End and Scollay

Square area undoubtedly tended to isolate the Bulfinch Triangle area, and contributed to a pattern of gradual deterioration in the 1970's.

There remained the traditional mix of uses in the area including institutional, office, furnishing business (retail, wholesale and manufacturing), and scattered residential. However, there was also an increase in low-end entertainment and restaurant activities and the closing of the Madison Hotel. The predominance of grade-level parking largely dedicated to government and institutional employees also had a negative effect on the area. The elevated Green Line along Causeway Street appears to have always limited uses along the end of the Bulfinch Triangle.

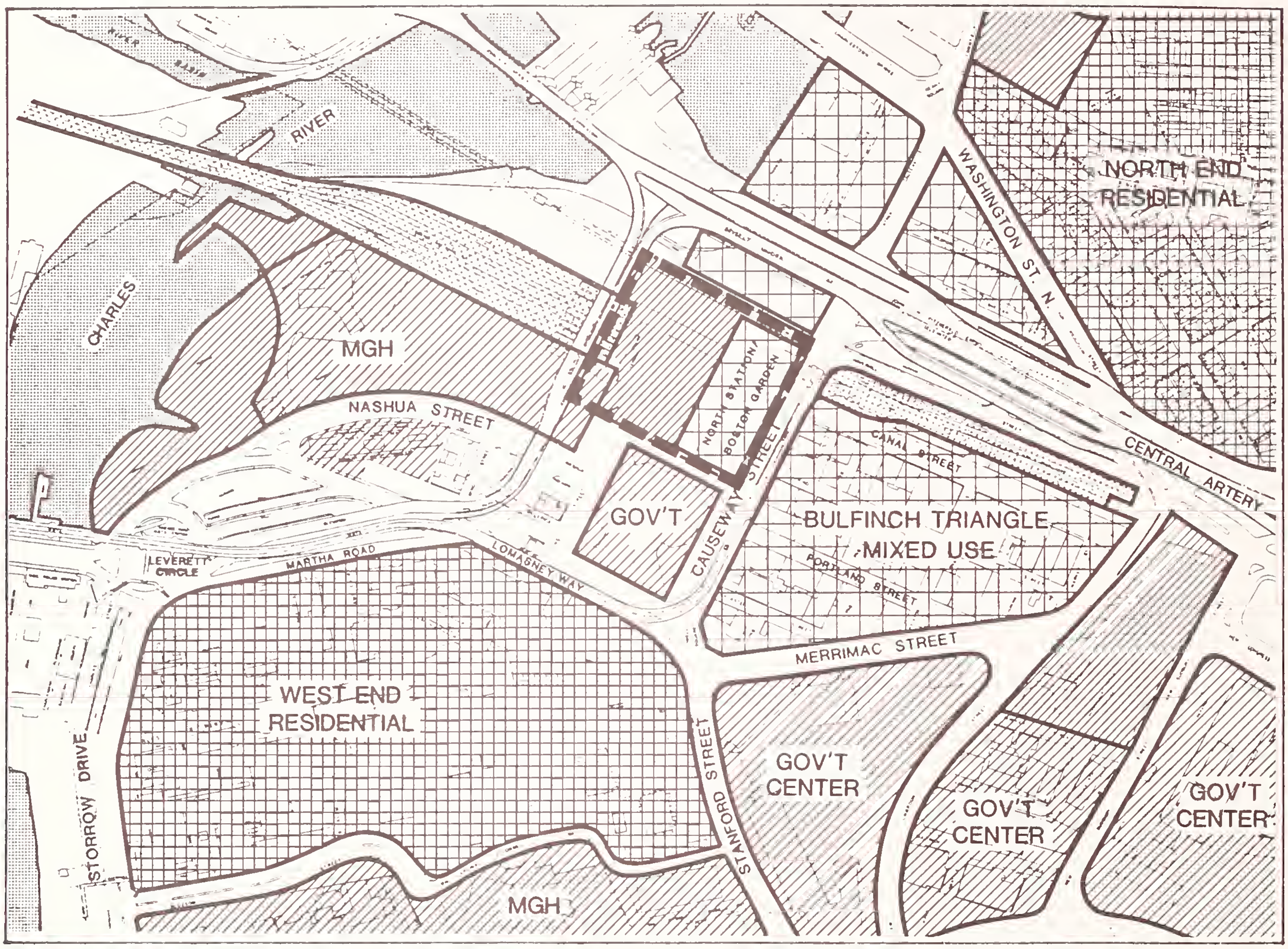
The zoning for the area remained inconsistent and was generally lower than other downtown areas with floor area ratios ranging from 2 to 4 as opposed to the more prevalent 8 to 10 in other downtown areas. A pattern of neglect and general disinvestment existed in the mid-1970's when a BRA revitalization plan entitled "New Directions for North Station" was produced. The plan identified conflicts and issues for the area and proposed a three phase strategy for turning the area around. Several of the BRA's Phase I and II proposals for street improvements and land-use changes have been implemented and have contributed to gradual reinvestment in the Bulfinch Triangle.

North Station Today: Signs of Revitalization

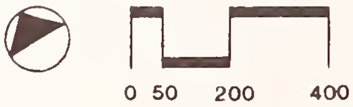
Context

The new arena site is located in the center of the North Station area as described in the "BRA Development Plan for North Station District". The district consists of about 75 acres and is bounded by Merrimac and Lowell Streets, Lomasney Way, North Washington Street, and the Charles River (see Figure 8-1). The district contains sub-areas of 1) the Bulfinch Triangle, 2) North Station, 3) the Nashua Street institutional area north of the Storrow Drive Ramps and 4) the Charles River and its banks. It is surrounded by several distinct neighborhoods including the North End to the east, Government Center to the south, the West End to the west, and the Charles River and Cambridge to the north. The evolving land uses are still very much impacted by the complex of transportation systems converging on the site.

FIGURE 8-1


RIVER BASIN
RIVER
CHARLES
MGH
NASHUA STREET
NORTH STATION
BOSTON GARDEN
CAUSEWAY STREET
WASHINGTON ST. N.
NORTH END RESIDENTIAL
CENTRAL ARTERY
CANAL STREET
GOV'T
BULFINCH TRIANGLE MIXED USE
PORTLAND STREET
LEVERETT CIRCLE
MARTHA ROAD
LOMASNEY WAY
MERRIMAC STREET
WEST END RESIDENTIAL
STORROW DRIVE
STANFORD STREET
GOV'T CENTER
GOV'T CENTER
GOV'T CENTER
MGH

EXISTING LAND-USE



Key

▦ MIXED USE

▦ RESIDENTIAL

▨ INSTITUTIONAL

░ TRANSPORTATION

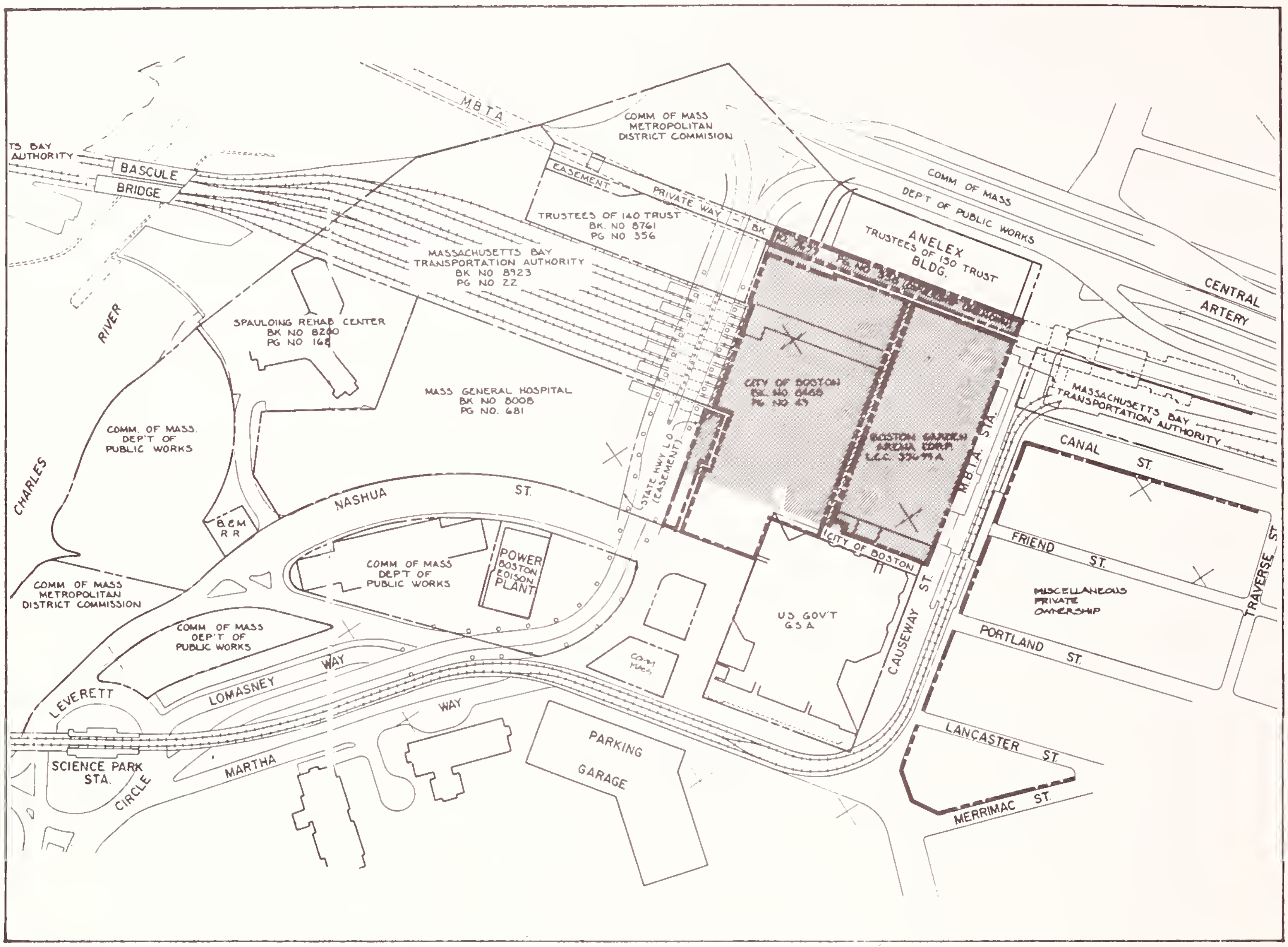
Current Land Uses

Current conditions show distinct signs of revitalization and re-investment in keeping with the BRA redevelopment plans. The reversal of a gradual deterioration and vacancy pattern can be attributed to two factors: public investment in the area and increasing demand for office space near the downtown Central Business District. Public investments over the past decade include 1) depression of the Orange Line, 2) completion of the Charles River Dam, 3) pedestrian improvements to Canal, Lowell and Merrimac Streets, and 4) the soon to be completed GSA office building (850,000 square feet). The steadily increasing demand for office space in the downtown area has led to conversion of loft spaces into offices in the southern portion of the Bulfinch Triangle.

Current land uses in the Bulfinch Triangle area remain similar in type to those historically occupying the 19th century buildings. However, there has been a diminishing of light industrial and manufacturing of household furnishings in favor of general office space. There are also pockets of residential and artists' lofts in the area. Causeway Street remains the most deteriorated area, especially below the elevated Green Line, and is characterized by fast-food restaurants and entertainment activities which have developed in response to the commuter rail station and Boston Garden across the street. Land use north of the Storrow Drive ramps has been largely devoted to on-grade parking for MGH and state office workers and is effectively being land banked until rail, highway, and riverfront plans are finalized. The area presently seems isolated from the Bulfinch Triangle because of barriers created by the elevated Green Line and highway as well as discontinuity of the street system. Activity patterns for the North Station zone will be clearer when the GSA building opens and commuter rail service is restored with the repair of the damaged bridge and rails.

Land Ownership

Present ownership patterns vary within the sub-areas shown in Figure 8-2. The Bulfinch Triangle is characterized by small parcels and multiple private ownership for all portions except the state and city-owned highway and transit corridor which bisects the Bulfinch Triangle. The North Station zone consists of larger parcels owned privately (the Garden and



TS BAY AUTHORITY
BASCULE BRIDGE
MBTA
COMM OF MASS METROPOLITAN DISTRICT COMMISION
EASEMENT
PRIVATE WAY
TRUSTEES OF 140 TRUST BK. NO 8761 PG NO 356
BK
COMM OF MASS DEP'T OF PUBLIC WORKS
ANELEX BLDG.
TRUSTEES OF 150 TRUST
CENTRAL ARTERY
MASSACHUSETTS BAY TRANSPORTATION AUTHORITY BK NO 8923 PG NO 22
SPAULDING REHAB CENTER BK NO 8200 PG NO 168
RIVER
CHARLES
MASS GENERAL HOSPITAL BK NO 8008 PG NO. 681
CITY OF BOSTON BK. NO 6468 PG NO 43
BOSTON GARDEN ARENA CORP. L.C.C. 35474 A
M.B.T.A. STA.
MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
CANAL ST.
COMM. OF MASS. DEP'T OF PUBLIC WORKS
STATE HWY LO (EASEMENT)
NASHUA ST.
B&M RR
CITY OF BOSTON
FRIEND ST.
TRAVERSE ST.
COMM OF MASS METROPOLITAN DISTRICT COMMISSION
COMM OF MASS DEP'T OF PUBLIC WORKS
POWER BOSTON EDISON PLANT
US GOV'T GSA
CAUSEWAY ST.
MISCELLANEOUS PRIVATE OWNERSHIP
PORTLAND ST.
COMM OF MASS DEP'T OF PUBLIC WORKS
WAY
LOMASNEY
COMM MASS
LEVERETT
WAY
MARTHA
PARKING GARAGE
LANCASTER ST.
SCIENCE PARK STA.
CIRCLE
MERRIMAC ST.

LAND OWNERSHIP

Key

▨ ARENA SITE

⬚ PARCELS REQUIRED

NOTE: Ownership map base prepared by: Parsons Brinkerhoff Quade Douglas, Inc., Boston. Attached plan shows owners of record but is not based on a full title search.

Anelex buildings) the City (parking area) and the Federal Government (GSA) with smaller parcels controlled by MGH and the BRA. The area north of the artery ramps consists of larger parcels owned by MGH, the State and the MBTA. The specific parcels required for the new arena are described in the following chapter, Real Estate Considerations.

Potential for Growth

The North Station district has long been recognized by the City and BRA to have substantial growth potential because of 1) general low density development, 2) good access, 3) proximity to Government Center and the downtown and 4) transportation system improvements which will eliminate many of the elevated barriers. The zoning for the area shown in Figure 8-3 reflects existing land-use patterns and has protected the historic character of the Bulfinch Triangle.

The GSA project represents how changes in zoning can encourage new office and retail development which is compatible with its surroundings.

The Future: City, State and Private Plans

Public Policy

Revitalization and development potential of the North Station area will be significantly affected by the outcome of the two major transportation projects currently being advocated by the State and supported by the City. The depression of the Central Artery will substantially effect the North Station site and the area north of the ramps by relocating the Artery and its ramp connections. The final plans and availability of Federal funding are uncertain, and key decisions had not been made prior to completion of this Arena Feasibility Study. The MBTA plans for depression and relocation of the Green Line combined with extension of the commuter rail tracks to the back of the Garden would substantially improve the Bulfinch Triangle by eliminating the elevated trackway and station and consolidating transit services. Funding is being sought for the transit package, but also remains an uncertainty.

The elimination of the Green Line elevated would have a dramatic, positive effect on Causeway Street while the artery depression would help restore the Bulfinch Triangle plan. The two BRA plans for the area, the 1977 "New Directions" and 1980 "District" both contain important policy directions for the whole district. They emphasize retaining the historical character of the Triangle, increasing development around North Station and developing the area between the ramps and the riverfront for medium density mixed use. Both plans suggest the need for revised zoning of the area north of Causeway Street. While many of the proposed objectives, guidelines, and phasing remain valid, fine tuning of the plan seems necessary pending the outcome of the funding and the timing of the two major transportation projects. The accompanying plan (Figure 8-3) summarizes the existing zoning and the two phases proposed in the BRA's 1980 district plan. The distinction of two areas will probably remain valid, but there is a need for an updated approach to zoning.

The "Change and Growth in Central Boston" report published in May, 1984 by the Greater Boston Chamber of Commerce continues to highlight the development opportunities for the North Station area. The report designates four "priority growth areas," including the North Station area, where "major growth will be encouraged, even if departing from existing bulk and density patterns."

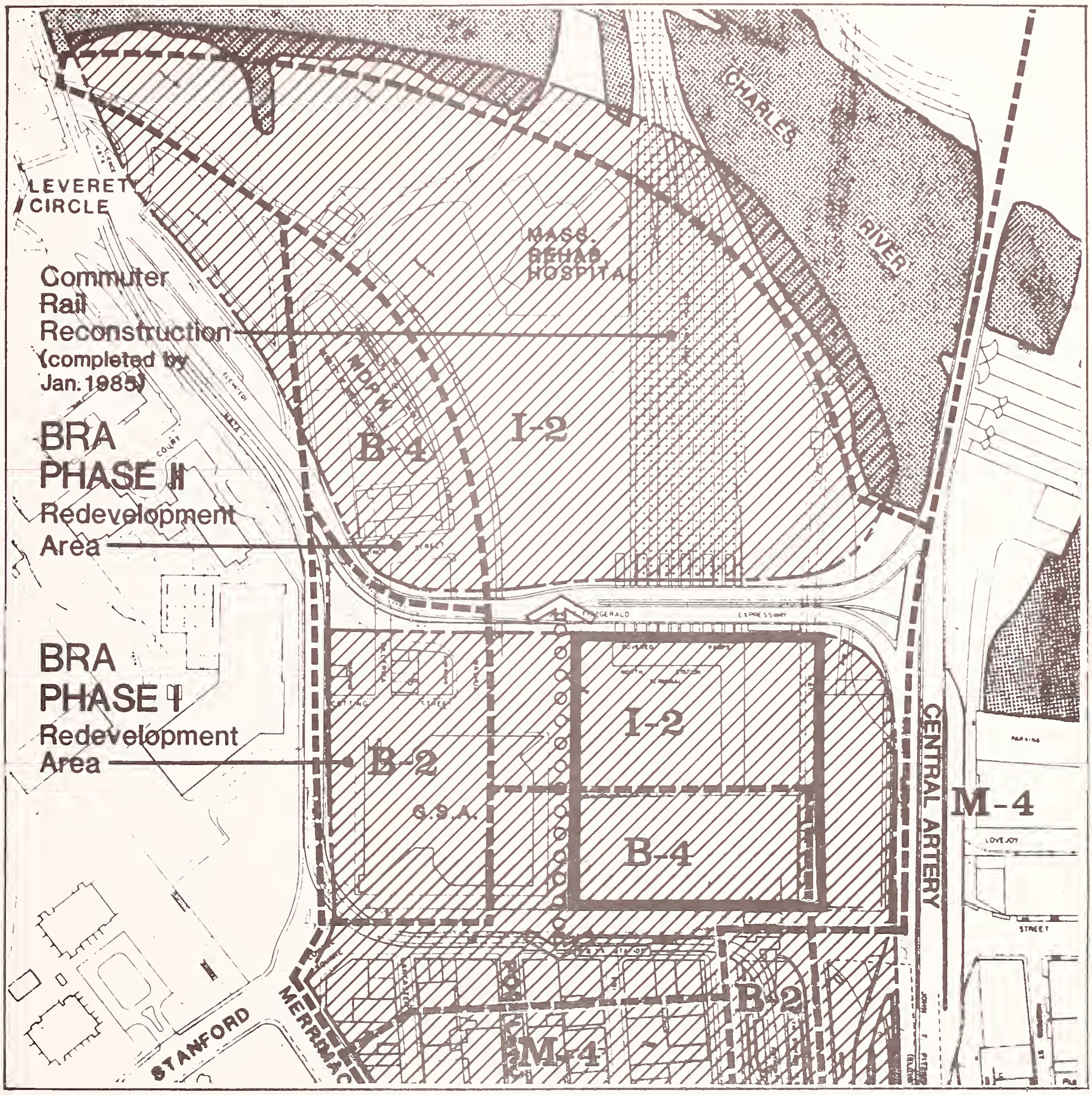
Private Plans

Another major factor in the future of both the North Station site and the area north of the ramps is the expansion plan being developed by Mass. General Hospital (MGH). This internationally renowned institution projects the need for more office space and substantial additional parking. Because MGH owns a large segment of the BRA's Phase II site and smaller portions of the BRA's Phase I site, it is essential to coordinate final arena plans with the hospital.

A New Arena

The proposed arena site is an appropriate land use for any of the transportation scenarios. The current parking area behind the Garden has limited development potential at present because of the highway barriers to the north and east, and the Boston Garden building to the south. The site would remain encumbered with limited commercial development potential under all transportation alternatives explored so far. A new arena would also free the current Garden site for more intensive office and

FIGURE 8-3


LEVERETT CIRCLE
Commuter Rail Reconstruction (completed by Jan. 1985)
BRA PHASE II Redevelopment Area
BRA PHASE I Redevelopment Area
CHARLES RIVER
MASS. REHAB HOSPITAL
NORM
I-2
B-4
B-2
G.S.A.
I-2
B-4
M-4
B-2
M-4
CENTRAL ARTERY
FITZGERALD EXPRESSWAY
LOVEJOY
STREET
STANFORD
MERRIMAC

EXISTING ZONING AND LAND-USE POLICY

Key

0 50 200 400

▭ ARENA SITE

┅ ZONING AREA

▨ BRA DESIGNATED REDEVELOPMENT AREA

I-2	GENERAL MANUFACTURING: FAR-2
B-2	RETAIL BUSINESS & OFFICE: FAR-2
B-4	RETAIL BUSINESS & OFFICE: FAR-4
M-4	LIGHT MANUFACTURING: FAR-4

retail development on a rejuvenated Causeway Street. The high degree of public and private access supports continued use of the site for an arena as it has been for several generations of Bostonians.

Land-Use Policy and Issues

The North Station district is a highly complex area of the downtown with a rich past and prospects for a healthy future. The basic framework for land use has been set and needs to be fine-tuned as state and MBTA transportation projects and implementation procedures are finalized.

The following land use issues should be considered in the ongoing redevelopment of the area.

- Two transportation projects will have significant implications for redevelopment potential and plans.
- District plans will have to be refined pending the funding and schedules of these projects.
- The status of the Central Business District office market and related planning will have to be carefully coordinated with the BRA's Phase I guidelines.
- MGH plans will have to be coordinated with the BRA's Phase I and II guidelines.
- Rezoning should be considered by the City in parallel with Phase I and II plan finalization.
- A new arena on the site north of the Garden is appropriate to either the existing or proposed highway context.
- The existing Garden site has substantial commercial development potential with the removal of the elevated Green Line on Causeway Street.

TRANSPORTATION

A Transporation Knuckle

The North Station area continues to be dominated by transportation uses and their various positive and negative impacts. A clear understanding of the existing and proposed circulation in and around the site is essential for a functional and feasible arena design. The two major transportation projects, the Green Line/Commuter Rail reconstruction and the depression of the Central Artery, must be considered as options until Federal funding is assured, and will have critical impacts on an arena design.

Existing Circulation Patterns

The interaction between existing modes of transportation and the Garden/North Station complex are instructive for projecting patterns for a new arena. The existing pattern is shown in Figure 8-4.

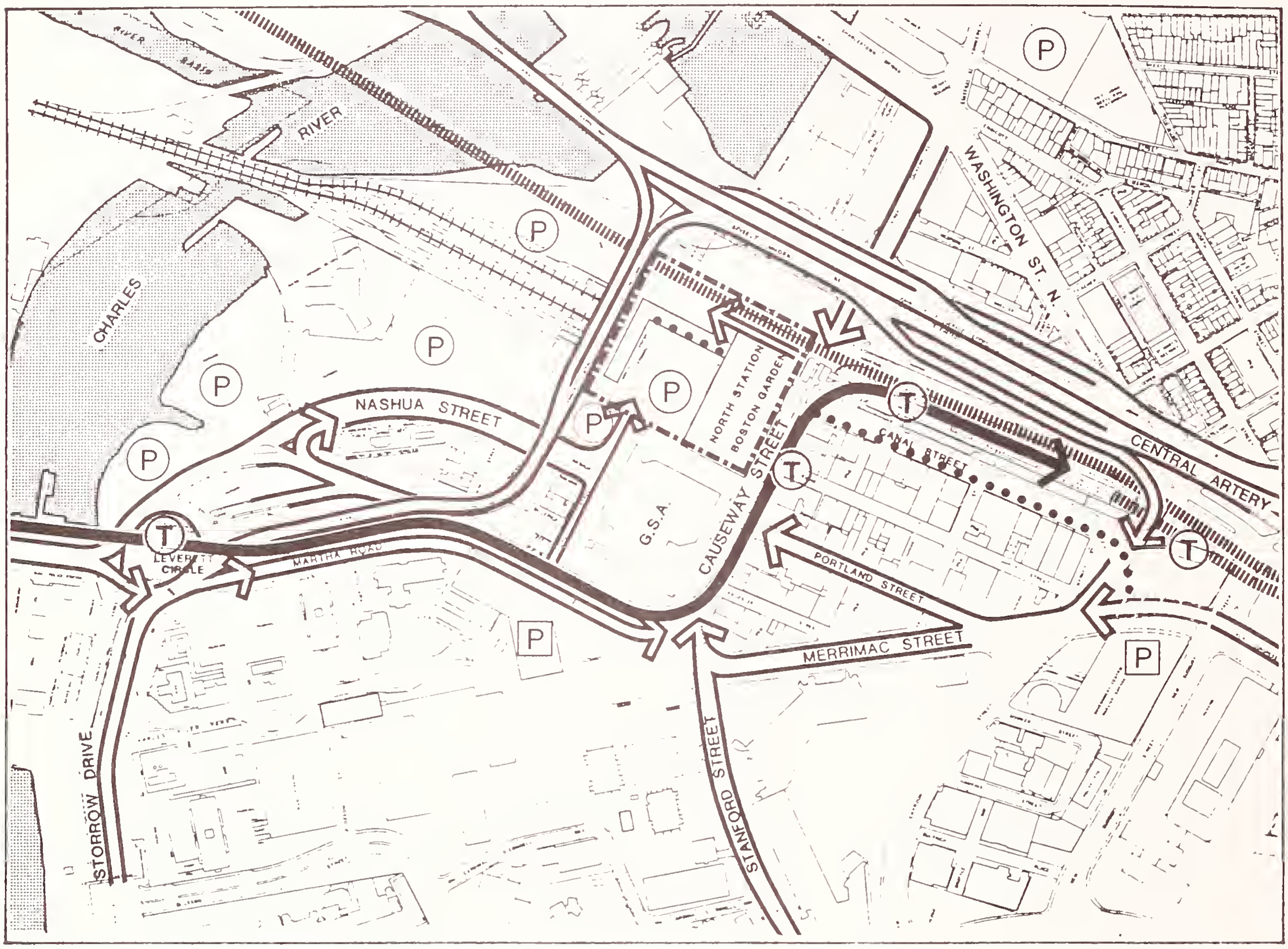
Traffic

The hierarchy of highways and roads provides excellent regional access to the site as has previously been described in the analysis of potential arena sites. Historically, Causeway Street has always been a terminus for the street network because of the extensive rail yards to the North side. As rail use declined, other land uses filled in but the street network remained subordinate to the highways, including the Storrow Drive ramps and the Leverett circle connections. Presence of the commuter rail tracks has precluded east-west connections on the river side of the ramps. Hence all movement from the west to Charlestown or the North End has been routed along Causeway Street. Causeway Street carries a variety of auto, truck, and bus traffic because it is the only east-west connection through the North Station district between Government Center and the Charles River. Vehicular access to the district occurs at Leverett Circle from the west on Storrow Drive and at Causeway Street from the south. Access from the north artery occurs at Haymarket. Access back to the highway network is somewhat different with 1) west access remaining at Leverett Circle, 2) north access at Leverett Circle and 3) south access at Causeway Street. The local street network is tied into these connections as well as the surrounding downtown circulation. The complex system, however, is presently clear only to regular users. Narrow streets, parking lots, and inadequate stacking space for highway ramps can cause traffic jams at peak hours.

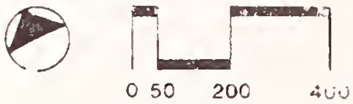
Mass Transit

The excellent transit access provided by Green Line, Orange Line and commuter rail is clearly a major asset for the site. The interface between lines is awkward but relatively convenient because of the physical proximity.

FIGURE 8-4


CHARLES RIVER BASIN
RIVER
CHARLES
P
P
P
P
P
P
P
P
P
NASHUA STREET
NORTH STATION
BOSTON GARDEN
T
T
T
T
CANAL STREET
CENTRAL ARTERY
WASHINGTON ST. N.
LEVERETT CIRCLE
MARTHA ROAD
G.S.A.
CAUSEWAY STREET
PORTLAND STREET
MERRIMAC STREET
STANFORD STREET
STORROW DRIVE

EXISTING CIRCULATION



Key

⟹	STREET/HIGHWAY NETWORK
━(T)━➜	TRANSIT - ELEVATED
┅(T)┅	TRANSIT - DEPRESSED
●●●●●●●●●	PEDESTRIAN PATHWAY
(P)	PARKING
⌐‐‐‐¬	ARENA SITE

Presence of the two lines along Canal Street on the east side compounds the barrier effect of the transit corridor. The elevated Green Line on Causeway Street has long limited redevelopment of the south side and created a dark, unpleasant pedestrian environment at street level. The GSA was attracted to the site partially contingent on a City and MBTA commitment to remove the elevated Green Line.

The commuter rail system remains as the only vestige of North Station, which in its prime was one of the busiest rail terminals in the country. What remains of long haul passenger rail has largely been transferred to South Station, as north bound passenger service has all but ceased. The recent fire which knocked out the bridge over the Charles has diminished activity at North Station to an all-time low at a time when Boston commuter rail use is increasing. Reconstruction of the bridge and tracks should reverse this condition.

Parking

The parking context at North Station is currently in a conflict between; 1) State transportation policy which tends to discourage parking around a major transit terminal, 2) City policy which places a lid on downtown parking and 3) private demand which according to MGH officials could fill as many as 4000 new spaces at MGH. The conflict centers around the coincidence of excellent vehicular access at the intersection of west and north/south highways, and transit access. The site would appear to be a logical place for a downtown perimeter parking terminus if ramp connections could be designed to withstand the additional loading.

Pedestrians

The pedestrian network reflects the local street system and follows several major patterns of movement. North Station serves as a destination for commuters at morning and evening peaks. They filter primarily through the Bulfinch Triangle, and secondarily from Mass. General Hospital through Charles River Park and along Nashua Street. The area also provides inexpensive and dedicated parking areas for downtown and institutional office workers. The Garden generates similar pedestrian surges for events, with many patrons walking from downtown jobs, parking, or transit stops. In addition, there is a more random pattern of movement within the Triangle to retail and entertainment functions, and to the

DPW building on Nashua Street. Pedestrian paths are well-defined since the limited through connections north/south and east/west usually dictate a single, efficient path. Canal Street is the dominant north/south path, and Causeway Street the east/west walkway.

Canal Street sidewalk improvements have improved the North Station/Haymarket connection and have catalyzed revitalization of the Bulfinch Triangle. Causeway Street remains a dismal pedestrian environment with only the south-lighted Garden arcade providing some relief as a covered access to the multiple entrances of the building. The elevated Green Line is the primary negative element on what would otherwise be a pleasant, broad collector street for the Bulfinch Triangle. The district is conspiciously lacking in open space and greenery. Linear park-like treatments such as those on Canal Street could be applied to Causeway Street, Nashua Street, Merrimac Street, North Washington Street, and other pedestrian connectors. Such measures would dramatically improve the street environment and provide a sense of more open space.

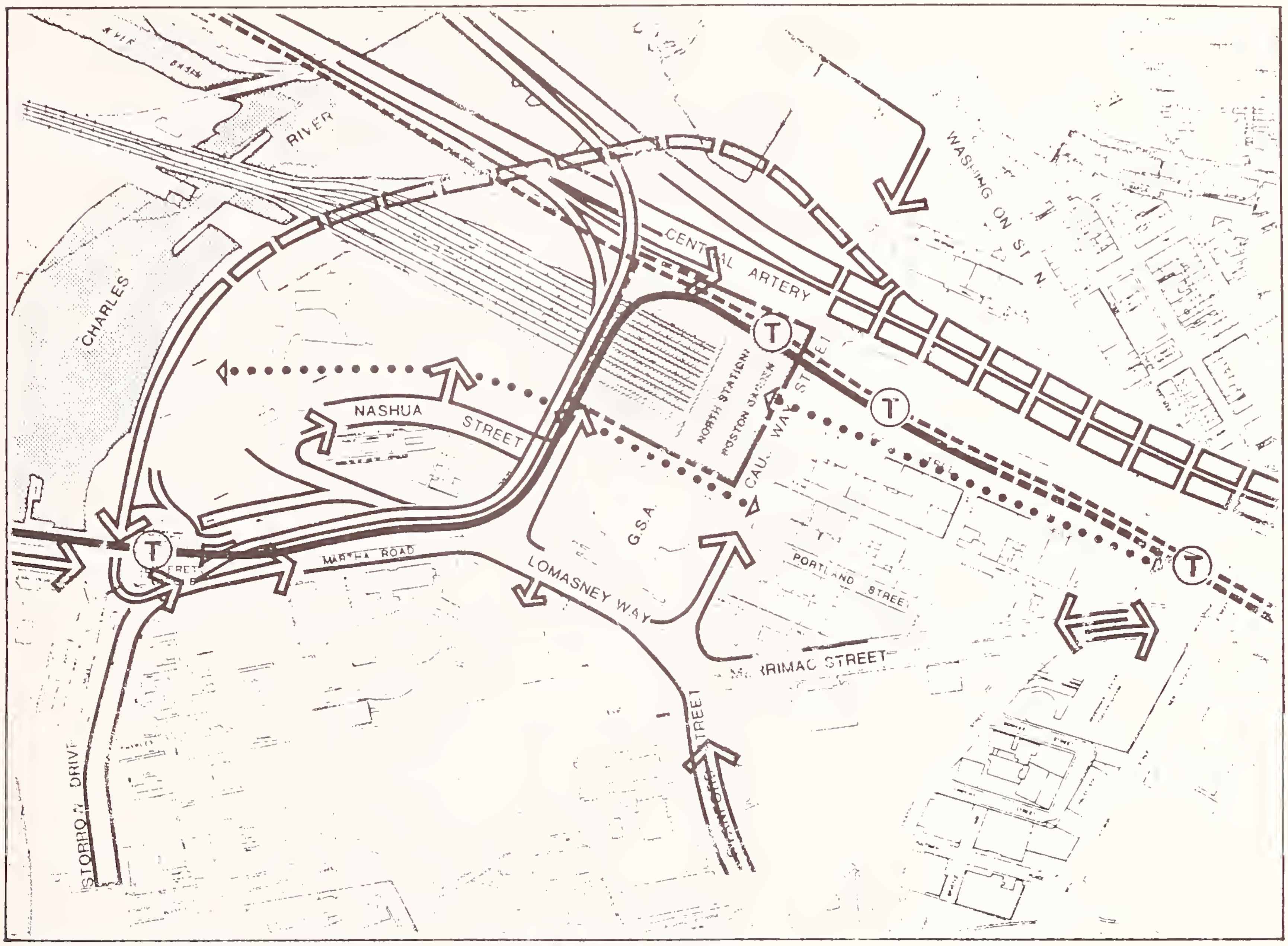
Proposed Transportation Changes for the North Station Area

Circulation in the North Station area will be improved if either or both of the proposed major transportation projects is implemented (Figure 8-5). The State and City are actively promoting depression of the Central Artery which will improve vehicular access to and through the downtown. These measures will improve access to the North Station area. The multi-facted transit project proposes to 1) depress the Green Line under and behind the Garden with a new stop in Accolon Way, 2) remove the elevated on Causeway Street, and 3) extend commuter rail tracks to the back of the Garden and reactivate direct station access to the platforms. All of these measures would improve access to the area and reduce negative transportation impacts on land uses.

Proposed Traffic Modifications

The preliminary plans for depressing the Central Artery submitted by the State to FHWA in the "June 1983 Supplement to the Draft EIS for the Third Harbor Tunnel, Interstate 90/ Central Artery, Interstate 93" include: 1) replacement of the Storrow/Leverett Circle connections to the artery with a combination of tunnels and elevated roadways, 2) depression of the artery southward under Causeway Street and

FIGURE 8-5


RIVER
CHARLES
NASHUA
STREET
CENTRAL ARTERY
WASHINGTON ST N
NORTH STATION
BOSTON GARDEN
CAUSEWAY ST
G.S.A.
MARTHA ROAD
LOMASNEY WAY
PORTLAND STREET
MERRIMAC STREET
STORROW DRIVE
STREET

PROPOSED CIRCULATION

0 50 200 400

Key

⇨ STREET/HIGHWAY: GRADE & ELEVATED

▭▭⇨ HIGHWAY: DEPRESSED

—Ⓣ— TRANSIT: ELEAVATED GREEN LINE

-Ⓣ- TRANSIT: DEPRESSED GREEN LINE

-Ⓣ- TRANSIT: DEPRESSED ORANGE LINE

●●●●●●●●● PEDESTRIAN PATHWAY

[- -] ARENA SITE

NOTE: Central Artery allignment based on Supplement To The Draft Environmental Impact statement/report; Third Harbor Tunnel, Interstate 90/Central Artery, Interstate 93. (June 1983)

3) alteration of access points to and from the artery. Such measures would be accompanied by local street improvements including extension of the east/west Traverse Street. The depressed artery would provide air rights and joint development opportunities to help restore the Triangle plan and eliminate the present barrier to the North End.

Current plans have not as yet finalized the Leverett Circle ramp connections which would have major impacts on the proposed Charles River esplanade extension, and the development potential for the BRA's Phase II site. Impacts on the new Arena site, however, would be construction-related and include the elimination of the Beverly Street access behind the Anelex building, the removal of the Anelex building, and possible highway tunnel construction in the vicinity of the arena. The arena site would also have major ramp construction on the north side and ramps rising to the east. The construction period is likely to be in the 8 to 12 year time frame if the DPW's project is funded by mid-1985.

Because of Federal funding uncertainties, the artery project must be regarded as a variable in planning for a new arena, even though it has high priority as a State transportation policy. In any case, the construction of a new arena is not contingent upon the implementation of the Central Artery depression.

Transit Projects

The relocation and depression of the Green Line has recently been studied by the MBTA and is proposed as phased construction if the new arena project goes ahead. A depressed, cut-and-cover section was proposed with station entrances located at the present Orange Line stop and in Accolon Way.

The new platform would be connected to the Orange Line allowing for an easy transfer point at North Station. The elevated section along Causeway Street and Lomasney Way would be removed after line relocation. Transit service would be considerably improved with these modifications and with the Orange Line Southwest Corridor completion.

Another proposed improvement is the extension of the commuter rail tracks to the back of the Garden to provide more direct patron service to North Station. While the City has questioned the necessity of this extension, the MBTA has indicated that it is required for operation of 10 car trains given the location of switches to the north. Some question remains as to how close to the back of the Garden the tracks need to be, a detail which would affect the design of a new train station built as part of a new arena.

The MBTA is pursuing funding of the North Station transit improvements, but these must also be regarded as variables until Federal funding is assured.

Future Parking Options

There are already two preliminary proposals for new parking facilities in locations in the North Station area, 1) between Canal Street and the Central Artery as an interim lot for North End residents as a part of the Artery reconstruction process by the State and 2) as an air-rights structure over the commuter rail tracks north of the Artery ramps combined with other development by MGH. State and City policies for the North Station district, although not specifically stated, are potentially in disagreement regarding the construction of parking terminals at a transit stop. A negotiated policy is likely to emerge when the final development guidelines for the Phase I and II sites are generated by the BRA.

The existing parking supply at the North Station site includes two surface lots behind the existing Boston Garden building which will be eliminated by the proposed new arena building. The supply of 5,500 parking spaces within 2,000 feet of the North Station site will thus be diminished by 780 spaces. However, the remainder of the existing parking supply currently available to the Boston Garden will probably remain in place to serve a new arena at the North Station site leaving 4,720 parking spaces available to the new arena.

Parking demand for an 18,000 seat arena facility would be approximately 5,250 spaces, assuming no significant shift occurs in travel modes and no additional parking is supplied. For purposes of this analysis, it is assumed that ten percent of available parking will be taken up by non-arena users and that on-street parking is not available to arena patrons. The total net deficit a new arena at North Station would face is thus approximately 1,400 spaces (See Exhibits 6-3 and 6-4). It should be noted that this figure is a conservatively high estimate, and that transportation improvements planned or underway by the MBTA should stimulate an increase in public transit utilization.

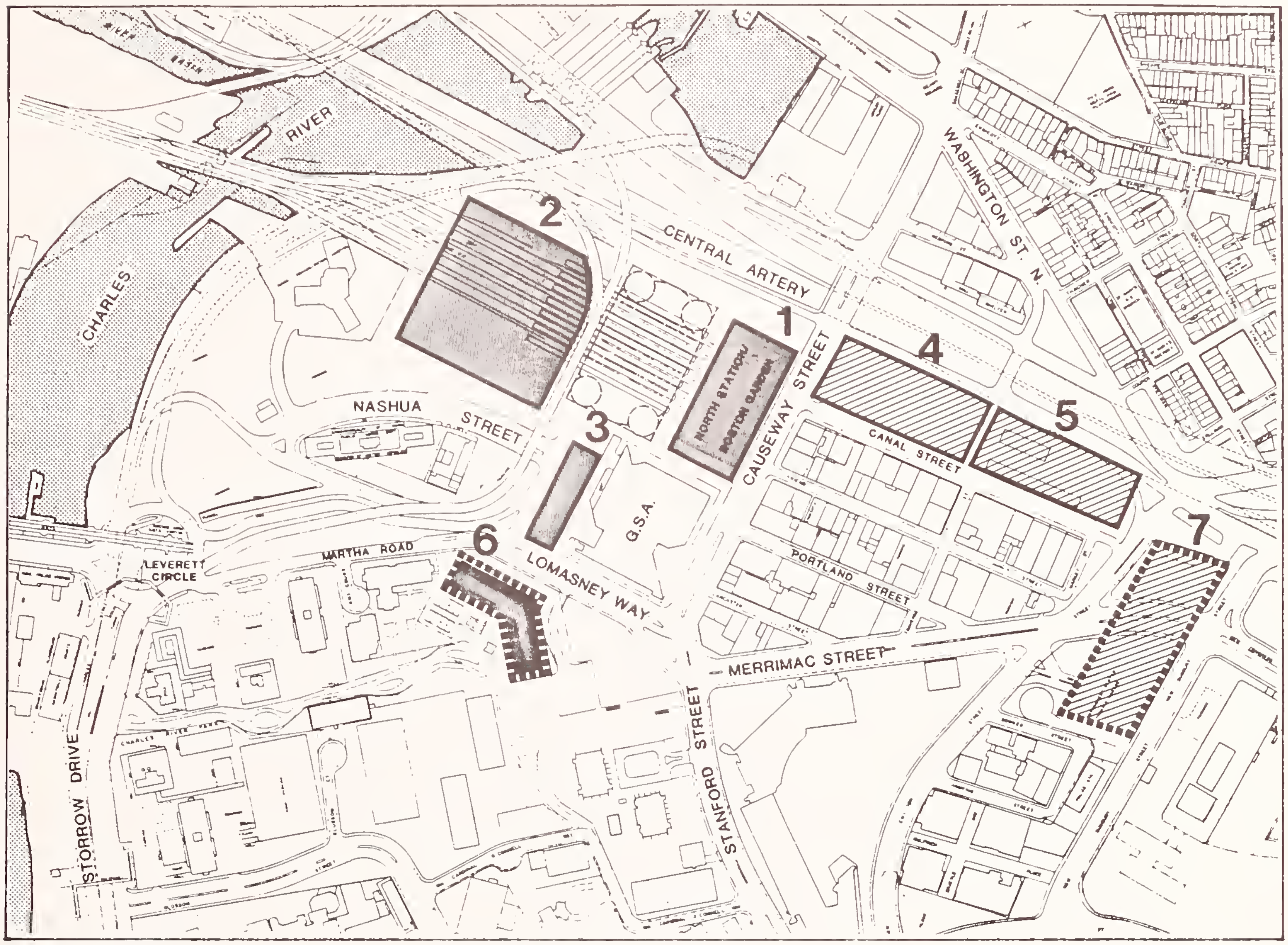
The Study Team examined a variety of scenarios for meeting this parking deficit. Beginning with a review of the parking structure proposed in the 1981 Arena Study which was to occupy a site directly north of the GSA building, the team evaluated seven sites in the vicinity of North Station which could meet the parking needs of a new arena at this site. (See Figure 8-6).

The site north of the GSA building proposed by the 1981 arena committee would severely limit access to the new arena built behind the existing Garden and to surrounding sites. Automobile queuing and entry and exit from a parking structure at this location would be constrained. The area available does not provide an adequate parking structure foot print and vehicular circulation space. The Study Team also feels that a parking structure above ground at this site would have a negative aesthetic impact on the area resulting from too much building on available open space.

Similar access problems and limited capacity are negative factors in the consideration of parking under the proposed development parcel south of the new arena building. Parking built in conjunction with the development of this parcel, although feasible and desirable, would not meet the immediate needs of the new arena.

Two sites north of the Storrow Drive ramps were considered by the Study Team. The first site spans the MBTA commuter rail tracks. This site would afford excellent access to the new arena and to the regional highway system. However, direct access to the local street network would be contingent upon an easement across land owned by the Massachusetts General Hospital. A site adjacent to the MBTA commuter rail tracks, on land owned by Massachusetts General Hospital, provides good access to the arena and

FIGURE 8-6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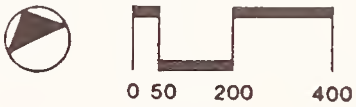
FUTURE PARKING OPTIONS



Key

1) DEVELOPMENT SITE

2) AIR RIGHTS/MGA

3) NORTH OF GSA

4) TRANSIT/BUS DEPOT

5) NORTH END RESIDENTS

6) CHARLES RIVER PARK (EXISTING)

7) GOVERNMENT CENTER (EXISTING)

local street network as well as the possibility of joint use by arena and hospital patrons. This site presents the best potential for meeting the moderate projected parking deficit which the proposed new arena would create.

Three other sites for parking structures could become available if and when the Central Artery is depressed. Two sites fill the block south of the existing Boston Garden building on the east side of Canal Street. The southern end of the block is dedicated to replace parking lost to North End residents and merchants when the Central Artery is depressed and cannot be assumed to be available for use by arena patrons. The northern end of the same block could potentially accommodate a parking structure if the design is coordinated with plans for a bus station at the site and Green Line/ Orange Line platform design concepts. It is questionable whether a parking structure is the best use of this site and whether it would be an appropriate development along Canal Street. An adjacent parcel will be created over the depressed Central Artery between Hanover Street and the North End. The development cost premium and uncertainty of timing make this parcel an underdesireable choice to fill the need for arena parking.

Parking Recommendation

Based on its evaluation of these alternatives, the Study Team concluded that the incremental parking demand in the North Station area which is created by a new arena is best met by development by the private sector, specifically the Massachusetts General Hospital, at a site north of the Storrow Drive ramps. Massachusetts General Hospital has proposed building structured parking on its property to meet employee parking demand. Hospital representatives have indicated that they would favorably respond to joint use of such a facility. The parking needs of arena patrons can best be met by this and other development of private parking alternatives in the area.

Pedestrian Improvements

Recent improvements to Canal Street should be expanded in any subsequent refinement of the BRA's Phase I and II plans. Clear and inviting connections from North Station towards Government Center and the downtown are included in earlier plans and should be pursued. Causeway Street revitalization is dependent on removal of the elevated.

It would be desireable to have a major new path connecting the Bulfinch Triangle and Causeway Street to the Charles River, in conjunction with esplanade expansion and land development north of the artery ramps. This pedestrian path will be a critical linkage between the arena and an MGH parking structure, if developed. The new GSA building will have an arcade on its south and east sides. Guidelines for design of a new arena should also address the desireability of an arcade around the base of the arena on the west side and on west, south, and east sides of the development site. Circulation within the new arena and development site is also important and is discussed in detail in the guideline section of this chapter.

Summary of Transportation and Circulation Issues

In summary, the following transportation issues should be considered in the development of final plans for a new arena:

- The arena site is well served by the present transportation system, but would be better served if either or both of the proposed transportation projects is implemented.
- Phasing of the new arena project is more complex if the Green Line is relocated, but without such relocation the substantial development opportunities cannot be realized.
- Highway access to the site from the north with a depressed artery needs further study.
- The arena should rely on privately developed parking where possible, such as MGH, for the additional spaces required pending a coordinated City and State parking policy.
- A major pedestrian path connecting Causeway Street to the Charles River is desireable, and should occur between the new arena and GSA building, extending northwards under the artery ramps.
- Further pedestrian improvements to other streets in the Bulfinch Triangle would improve the overall image of the area, and help to link the arena site with Government Center, the Waterfront and the Financial District.
- In final design of the new arena, consideration should be given to including an

arcade around the perimeter of the arena (west) and development site (west, south, and east).

URBAN DESIGN CONTEXT

Existing Context

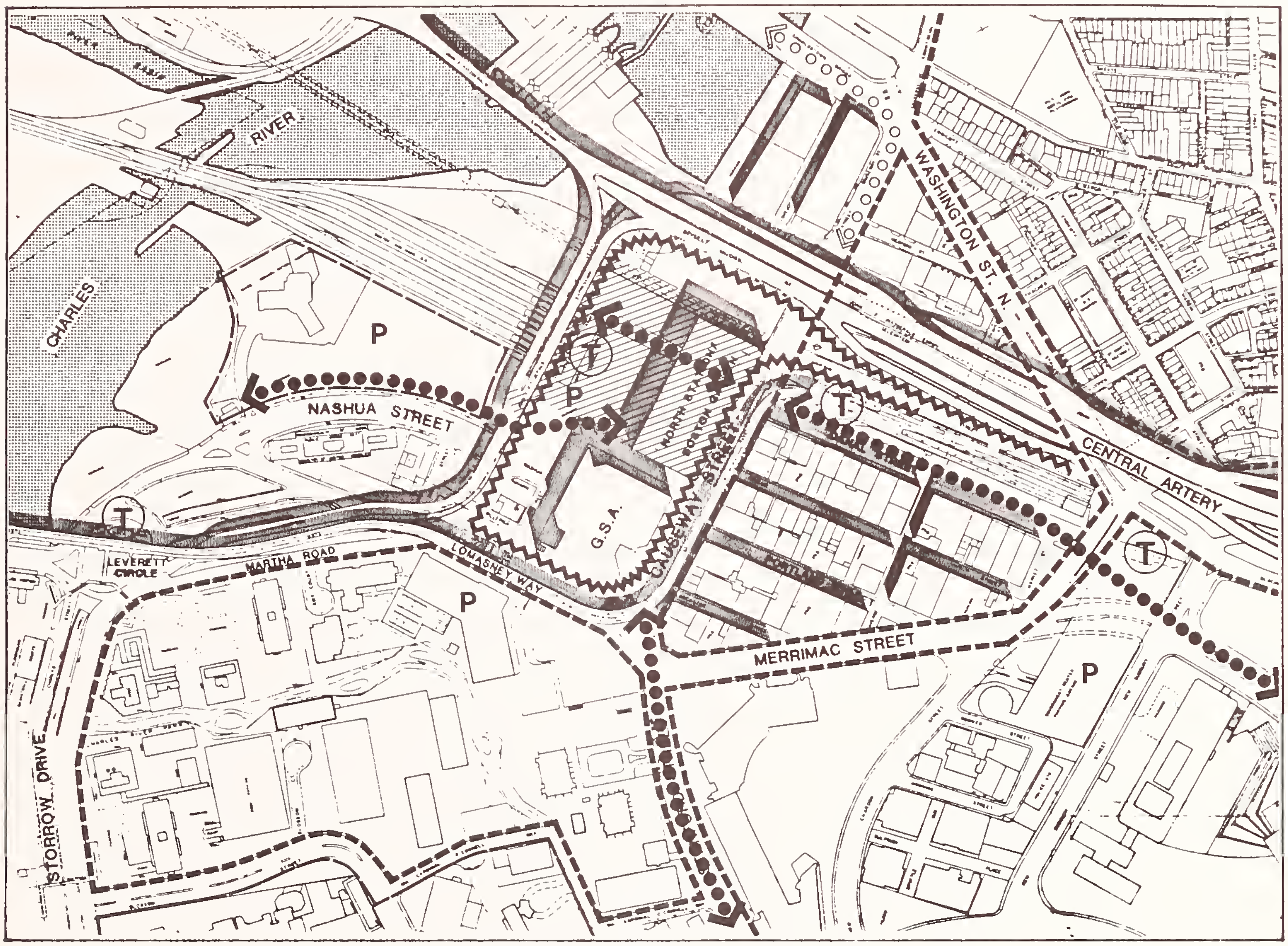
The greater North Station area is one of contrasts, pockets of discontinuity, and clearly defined sectors. These characteristics appear to have positive and negative impacts on a new arena. However, the presence of the existing Garden allows for an accurate projection of what effects a new arena would have on the area. The dominant characteristics of the site as it is currently used and perceived by the people who use it are summarized in Figure 8-7. A new arena design should consider the following conditions which make the North Station a unique and multi-faceted district in the downtown.

The North Station District

The North Station area has a rich and varied history as a transportation terminus gateway and gathering place for Bostonians and northern New Englanders arriving in the downtown. The district is more legible and understandable from the elevated highways and transit than at grade. Viaducts tend to wall-off sub-areas from one another, and each area displays a different character, use mix and building pattern.

The district includes three distinct areas; 1) the Bulfinch Triangle, 2) North Station, and 3) the area north of the ramps to the Charles River. It is abutted by Charles River Park, Government Center, and the North End. The area has a discontinuity of streets and pathways. A basic collector patterns exists around the perimeter and east-west on Causeway Street with short, discontinuous secondary streets.

With a generally low-rise building pattern, the dominant physical image at street level in all sub-areas is one of enclosing walls and barriers. The Bulfinch Triangle is the only sub-area with a sense of place based on the scale, density, detailing and homogeneity of 19th century buildings. Another dominant image in the North Station and north of ramps area is grade-level parking which is impenetrable and large in area.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WASHINGTON ST. N.
CENTRAL ARTERY
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MERRIMAC STREET
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STORROW DRIVE

EXISTING URBAN DESIGN CONTEXT

0 50 200 400

Key

〰	BARRIER
⬚	DISTRICT
‹●●●●●●›	MAJOR PATHWAY
▨	MAJOR STRUCTURES: BUILDING & VIADUCTS
Ⓣ	TRANSIT STATION
P	PARKING
▨	ARENA SITE

Amenities are few, with the Canal Street improvements providing the only open-space and green space attraction to pedestrians. Pedestrian paths are discontinuous but characteristically lead to North Station as a destination. The GSA building site has eliminated the path along Nashua Street which used to connect the Bulfinch Triangle and the Charles River. Ground floor circulation through the Garden is essentially a continuation of the public pathway system.

The Causeway Street elevated Green Line creates a dark, dirty, cold and foreboding environment which is compounded by the nature of the businesses on the south side of the street. As a result, the area does not seem safe to some visitors.

Arena Site

The North Station block is visually and psychologically isolated by having viaducts ranging from 50 to 80 feet high on all sides. Buildings are visually cut off from within and from outside the site. Because of its physical isolation, the Garden has minimal visual and perceived impact on surrounding sub-areas. Periodic parking pressures and crowds from events are the primary impacts felt by nearby residents. The presence of the Charles River is obscured by the Garden, as are other views to the city because of the viaduct barriers at street level.

The Bulfinch Triangle building facades are the most dominant visual presence near the Garden. While the art deco style Garden does not have the same color of brick or similar building mass, its detailing is such that it seems to blend in reasonably well with the character of buildings in the Bulfinch Triangle.

URBAN DESIGN ISSUES AND OPPORTUNITIES

Summary of Context

The general image of the North Station area is one of small, discrete and legible sub-areas. Taken together, however, they lack continuity of pathway, scale, pattern, land-use, building style and vehicular access. The overall impression is one of confusion and fragmentation with some concerns about public safety. Any district plans should consider enhancing and developing continuities and connections of sub-areas to each other and to the downtown.

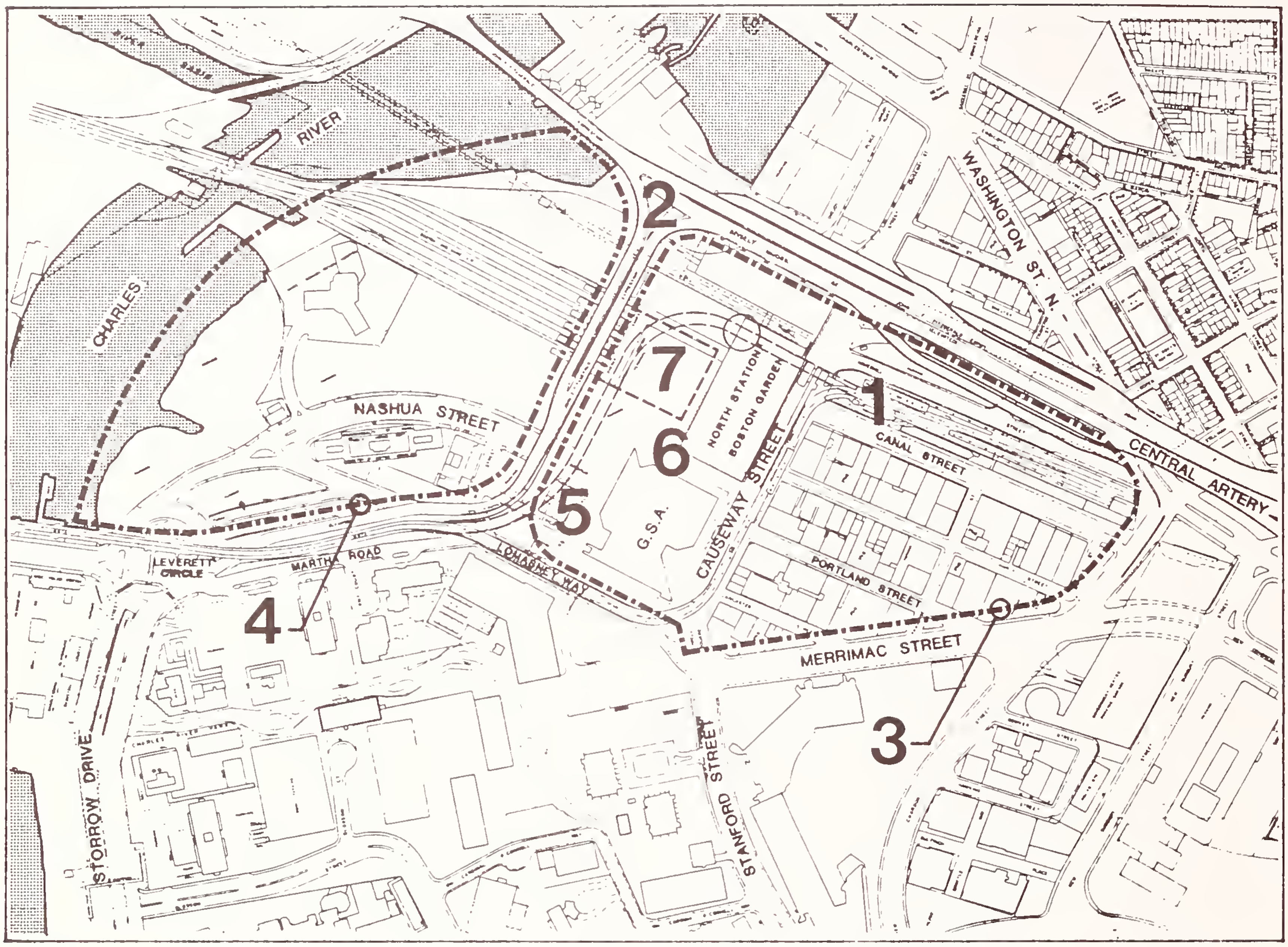
Summary of Major Issues Affecting the Arena Site Plan

The anticipated changes in the land-use, redevelopment and transportation systems in the North Station area place constraints on the site design as well as present opportunities for revitalization of the area and its principle activities. The locations of these urban design issues and opportunities are referenced by number in Figure 8-8.

1) Green Line Relocation: The proposed realignment behind the Garden and below grade along with a new station entrance in Accolon Way pose signifiant constraints on the new arena construction. In the long run these actions will vastly improve transportation service and redevelopment potential of the Garden site on an improved Causeway Street. The removal of the elevated will dramatically improve Causeway Street, and should provide a better pedestrian environment at the head of the Bulfinch Triangle.

2) Central Artery Reconstruction: The depression and ramp reconstruction of the artery and Storrow Drive ramps would have a two-fold effect on a new arena. The impacts would include removal of the Anelex building and construction period disruption. Service access to the east of the site would be affected and design coordination would be required to provide access to the north part of the site around Accolon Way. In addition, highway access to and from the north would be required in final design of the artery. Benefits would accrue upon completion with improved downtown and North Station access.

3) BRA Phase I Redevelopment Site: City Land-Use Policy and Design Guidelines: Depending on the timing of approval, funding and design of the two major transportation projects, the City, through the BRA, would have to update and revise the Phase I area plan and design guidelines for the Arena/development site. The context of the North Station site has changed considerably since the BRA Phase I plan was prepared by virtue of the revised Green Line design and plans for depression of the Central Artery. It is recommended that the floor area ratios and zoning for the site be reconsidered in light of both arena needs and general development policy for the area. Design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CENTRAL ARTERY
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MERRIMAC STREET
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LEVERETT CIRCLE
MARTHA ROAD
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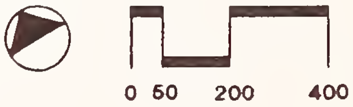
URBAN DESIGN ISSUES AND OPPORTUNITIES



Key

1) GREEN LINE RELOCATION

2) CENTRAL ARTERY RECONSTRUCTION

3) PHASE I REDEVELOPMENT AREA

4) PHASE II REDEVELOPMENT AREA

5) PARCEL NORTH OF GSA

6) NEW PEDESTRIAN STREET

7) COMMUTER RAIL TRACK EXTENSION

guidelines are needed for the Garden site in terms of massing, set backs, open space, materials, scale circulation and recommended uses.

4) BRA Phase II Redevelopment Site: City Land-Use Policy and Design Guidelines: The Phase II site also requires redevelopment plan refinement pending the final outcome and design of the artery project. The policies set for Phase II will directly affect the area in terms of 1) parking policy depending on size, location, and management, and 2) location of pedestrian circulation from the Bulfinch Triangle past the arena to the riverfront. Other issues requiring guidelines are: 1) use of MGH land and zoning, 2) air rights and joint development over the commuter rail tracks, 3) the overall street and pedestrian network, and 4) the riverfront esplanade programs and design.

5) Parcel North of GSA Building: Another parcel within the BRA Phase I area requiring city land-use policy and guidelines is the area between the GSA building and the Storrow Drive ramps. Various uses have been proposed for the site including parking and open space. It would be desireable that the Phase I plan consider approaches to the new arena as well as other circulation issues in determining final disposition of the parcel.

6) New Pedestrian Street Connecting Causeway Street to the River Front: The closure of Nashua Street from the ramps to Causeway Street to create the GSA site closed off the direct link from the Bulfinch Triangle to the river. The new arena site plan would allow for enough right-of-way between the arena and GSA buildings to provide an ample pedestrian street with emergency vehicular access. The character, design guidelines, ownership, and maintenance of this street need clarification as part of the BRA's Phase I policy plan.

7) Extended Commuter Rail Tracks and Station Design: The proposed extension of the commuter rail tracks to within 16' of the existing Garden creates the major air rights construction condition on which the new arena design would be based. The extent to which the tracks approach the back wall of the existing Garden building will affect station design and arena circulation. While the present station would

accommodate full extension of tracks, the new arena plan and station design would benefit if the tracks were terminated 30' to 35' from the present wall to allow for flexible station design and a circulation space at the head of the tracks just north of the Galleria. The clearance envelope and revitalization requirements will determine the final height of the arena floor and affect vertical circulation. The shared construction by MBTA and MCCA caused by air rights and joint development need to be factored into the contracts, shared costs, and construction phasing.

URBAN DESIGN GUIDELINES

Arena Goals and Objectives

In order to provide a framework for future design of an arena, the following goals and objectives for the arena site plan and building design have been established. The goals and objectives are based on the following factors: 1) the existing and proposed urban design context, 2) the arena program needs, and 3) city land-use and redevelopment policy for the North Station district. The goals have been separated into separate sets, one for the arena and one for the complimentary development site.

Arena Goals and Objectives

The following list indicates goals and objectives for the arena site plan:

Create a new first class arena for Boston which will have greater capacity, be more pleasant, safer, more accessible, and have a longer life span than the present Boston Garden building.

- Provide a larger capacity than the existing Boston Garden based on site capabilities and market analysis.
- Develop easy access from train-level Galleria to a continuous arena concourse level circulation to orient the patron.
- Provide excellent sight lines, and good seating units.

Provide a sense of tradition and continuity from the Garden to the new arena by incorporating Garden elements in the new design.

- Continuing North Station site and Causeway Street address as the traditional home of the Bruins, Celtics and other annual events.

- Integrate aspects of the current Garden in the new design such as team banners, the parquet floor, and flag poles on top of the building.

Provide continuous operation of the Garden during arena construction in order to keep teams and other events in Boston.

- Design and phase construction of arena and other transportation projects so that Garden can function until the new arena is operational.

- Acquire the Garden at the end of the arena construction and institute new MCCA management of the new facility with no loss of events.

Incorporate rail station and transit stations as integral components of the new arena to continue the use of the site for a multiple use transportation terminal and arena facility.

- The MBTA and MCCA should collaborate to design North Station and the Green Line station as open to the Galleria as possible.

- Design the site plan to equally emphasize use of buildings as both transit terminal and arena.

Minimize land takings by MCCA for new arena in order to allow other uses in the district to continue or new uses to happen, and to minimize public land acquisition.

- Design of arena and support facilities as compactly as possible without sacrificing smooth functioning.

- Use existing and planned parking spaces to be provided by private sector development.

The building design should respect the historical context of Causeway Street and the Bulfinch Triangle through massing, detailing, materials and site connections.

- The large mass of the arena should be screened by either new construction or by retaining the Garden facade on Causeway Street.

- Pedestrian connections should respect the existing pathway network.

Respect City land-use, redevelopment policy and design review process in order to best respond to district and downtown planning directions.

Minimize community impacts during construction and operation of the arena through design, scheduling and management.

Provide a servicing system which minimizes the inconvenience of the arena floor level above the rail tracks by providing an efficient ramp and distribution network.

Site plan should accommodate surge pedestrian loading anticipated for transit and arena uses as well as work for lesser mid-day conditions. Projections for future volumes in rail and transit use should be considered.

- Galleria and Atrium need to accommodate overloads, queuing and waiting functions.
- Ramp and escalator locations should be compatible with through pedestrian movements.
- Crossing movements for simultaneous rail, transit and arena pedestrian movement should be minimized.

Interior open space should be provided in the Galleria and Atrium spaces in conjunction with the circulation spaces. Planting, benches, and other amenities should be incorporated.

Provide exterior landscaping, streetscaping and open space to complement the building and its surroundings, particularly on the western edge.

Development Site Goals and Objectives

The following goals and objectives are recommended for redevelopment of the Garden site by the private sector:

Encourage development that will be compatible with and enhance the arena project since the new private development will provide a "front door" for the arena.

Require developer to provide and maintain easements at ground floor level to insure direct access and support facilities for the arena, train station, and transit stop.

- Grant a permanent easement for the Atrium and design it as the main arena and train station entrance.
- Provide separate and clearly articulated office and atrium entrances on Causeway Street.
- Provide area for Green Line station.
- Develop retail uses with direct access to Galleria and Atrium.
- Provide continuous arcade on west, south and east facades.

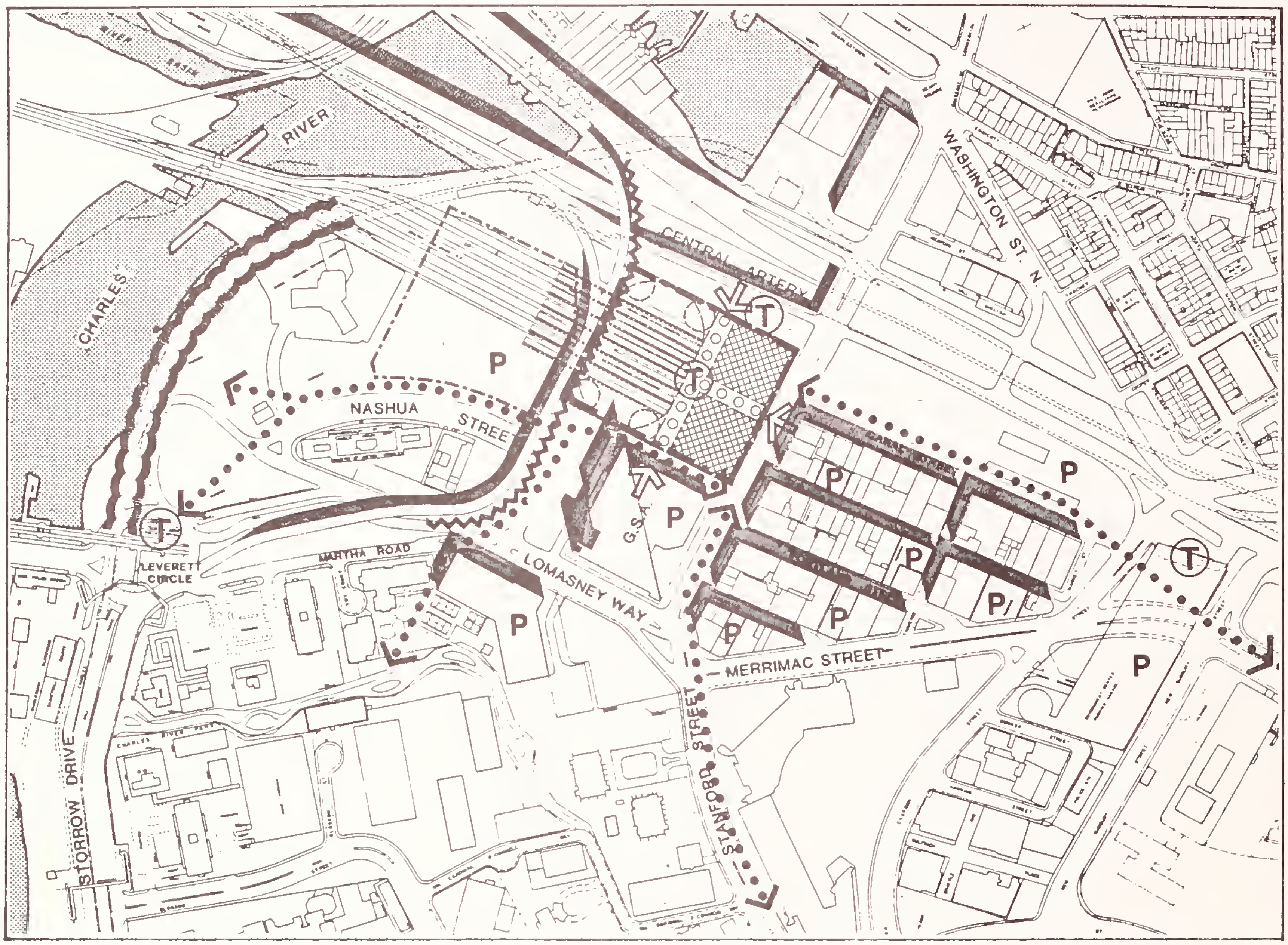
Recommend compatible building massing and design for site which balances arena needs with general redevelopment goals and policy for the redevelopment district.

- Development design should screen the arena from Causeway Street.
- Scale and detailing of buildings should be compatible with south side of Causeway Street and GSA building.
- A continuous facade should be provided on Causeway Street up to 80', approximately the height of buildings on the south side of Causeway Street.
- Multiple entrances should be provided around and through ground floor development.
- Parking below grade may be provided if it is not too disruptive to other ground level activities.
- Servicing should take place on east in Accolon Way and west in the new pedestrian street.

Purpose and Implementation of the Urban Design Guidelines

The following guidelines are provided to establish design requirements for the site plan and ground floor circulation of the final arena design. The relationship of the new arena to the district is shown in Figure 8-9. A diagram of the arena site plan concept is shown in Figure 8-10.

FIGURE 8-9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MARTHA ROAD
LOMASNEY WAY
MERRIMAC STREET
STANFORD STREET
STORROW DRIVE
CHARLES RIVER PARK
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T

PROPOSED URBAN DESIGN GUIDELINES

0 50 200 400

Key

〰 BARRIER

⟨●●●●●●⟩ MAJOR EXTERIOR PATHWAY

⟨○○○○⟩ MAJOR INTERIOR PATHWAY

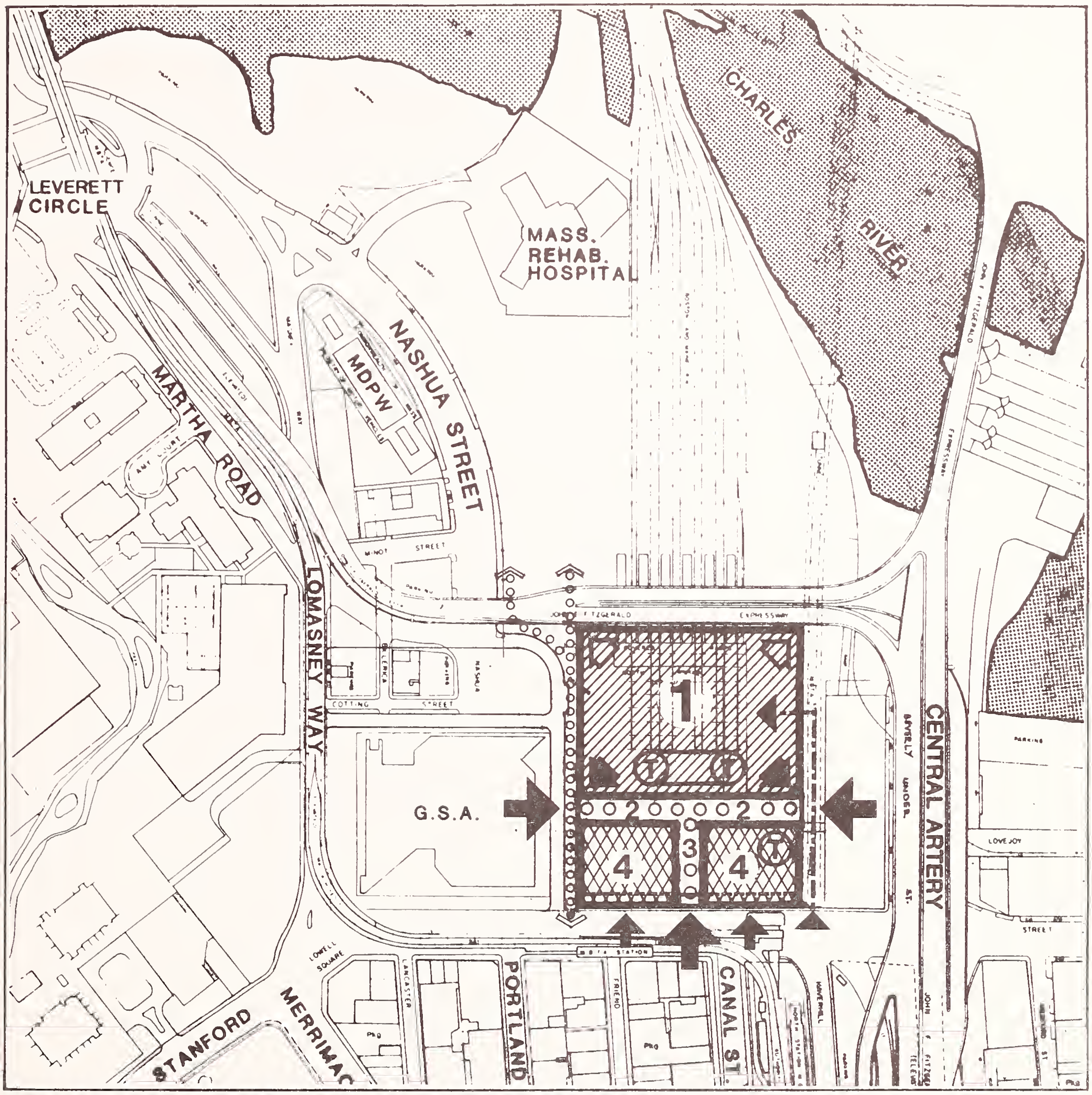
▨ MAJOR STRUCTURES: BUILDINGS & VIADUCTS

Ⓣ TRANSIT STATION

┆ AIR RIGHTS SITE

┇ ARENA SITE

FIGURE 8-10


LEVERETT CIRCLE
MASS. REHAB. HOSPITAL
CHARLES RIVER
MDPW
NASHUA STREET
MARTHA ROAD
AMY COURT
LOMASNEY WAY
MINOT STREET
COTTING STREET
BILLERICA
NASHUA
JOHN F. FITZGERALD EXPRESSWAY
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G.S.A.
BEVERLY UNDER ST.
CENTRAL ARTERY
LOVEJOY
STREET
PARKING
LOWELL SQUARE
LANCASTER
MBTA STATION
PORTLAND
FRIEND
CANAL ST
HAVERHILL
NORTH STATION
STANFORD
MERRIMAC
JOHN F. FITZGERALD
PKG

SITE GUIDELINES CONCEPT PLAN

Key

○○○○○○○	PEDESTRIAN PATH
➡	PEDESTRIAN ENTRANCE
⇨	ARENA EGRESS
▶	SERVICE ENTRANCE
Ⓣ	TRANSIT AND COMMUTER RAIL

1) ARENA

2) GALLERIA

3) ATRIUM

4) DEVELOPMENT SITE

The complexity of the existing site and proposed transportation projects requires a specific construction sequence. The guidelines have been developed through analysis of the site and program and through design feasibility testing. The proposed schematic design concept for a new arena (Chapter 7 of this report) illustrates how the following guidelines could be applied and suggests conceptual design approaches. These guidelines also highlight important contingencies which would require varying design responses. The guidelines can be related to the illustrative site plan shown in Figure 8-11.

Site Plan

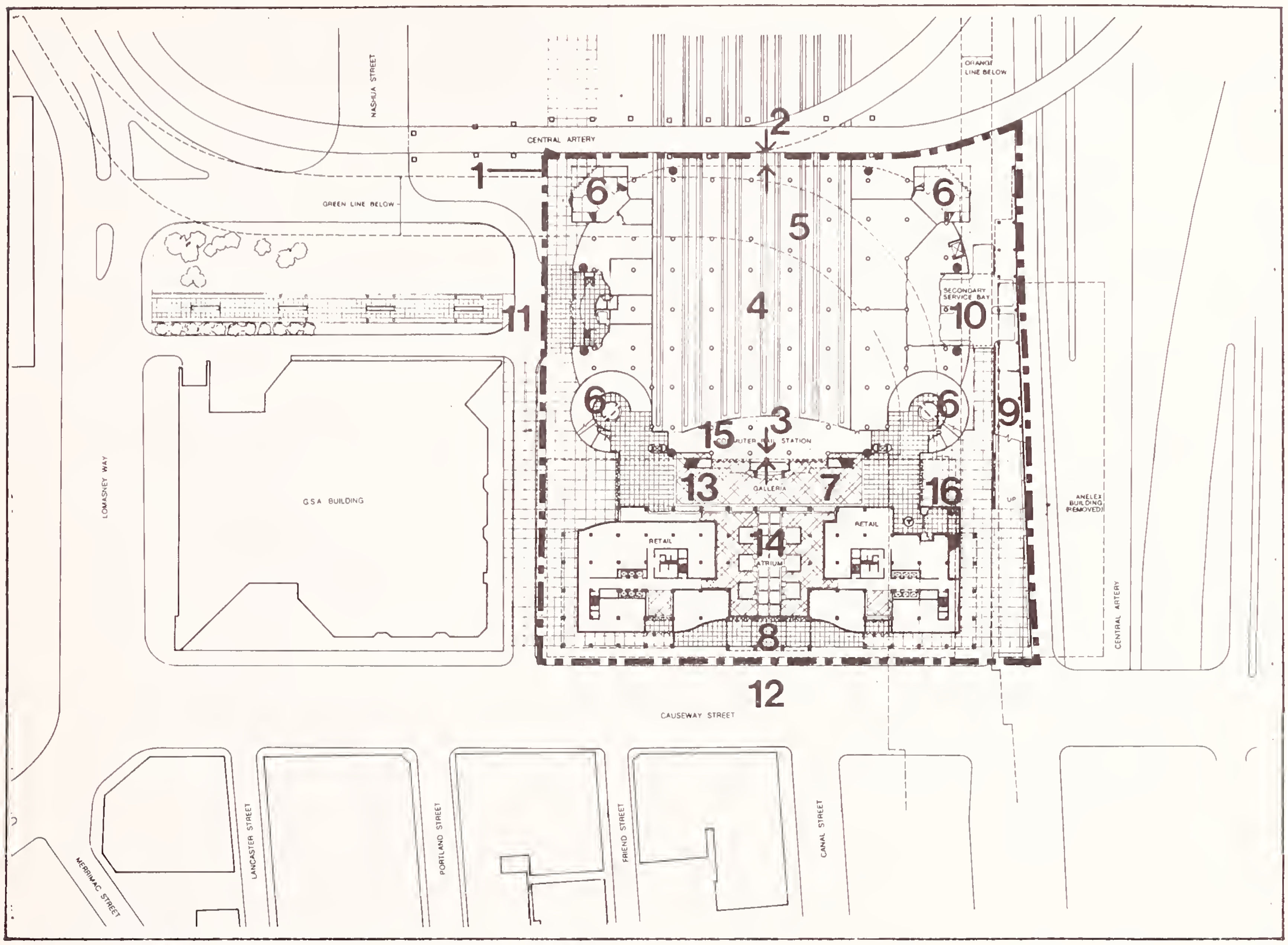
Basic Site Plan Requirements:

- Site limits (1) determined by footprint required, existing and proposed transportation projects, limits of existing structures and construction phasing.
- Building setbacks (2) from Central Artery ramps, determined by structural footings.
- Building setbacks (3) from existing Garden, determined by fire egress, emergency access and Garden foundation conditions.
- Air-rights (4) structure required over commuter rail tracks and platforms with 18-foot clearance over tracks affecting arena column spacing (to be coordinated with final MBTA plans).
- Air-rights construction of portions of ground level over MBTA Green Line tunnel (5) affecting column spacing (to be coordinated with final MBTA plans).

Site Circulation Requirements:

- Arena access/egress at four corners of building (6) by primary ramps on south side, secondary stairs on north side, and by escalators in Galleria. Handicapped elevators provided off Galleria near ramps.
- Pedestrian access to the arena and transit stations (7). 1) new pedestrian street along west side between site and GSA with galleria entrance, 2) atrium through center of development site, 3) pedestrian street at east side along Accolon Way, 4) emergency exit path from northeast corner.

FIGURE 8-11


NASHUA STREET
CENTRAL ARTERY
GREEN LINE BELOW
ORANGE LINE BELOW
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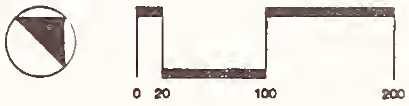
11
10
SECONDARY SERVICE BAY
6
6
9
3
15
COMMUTER RAIL STATION
13
GALLERIA
7
16
UP
ANELEX BUILDING (REMOVED)
RETAIL
RETAIL
14
ATRIUM
8
12
CAUSEWAY STREET
LOMASNEY WAY
GSA BUILDING
CENTRAL ARTERY
MERRIMAC STREET
LANCASTER STREET
PORTLAND STREET
FRIEND STREET
CANAL STREET

ILLUSTRATIVE SITE PLAN



Key

1) SITE LIMITS ┅

2) BUILDING SETBACK FROM RAMPS

3) BUILDING SETBACK FROM GARDEN

4) AIR RIGHTS OVER RAIL

5) AIR RIGHTS OVER TRANSIT

6) ARENA ACCESS/EGRESS

7) PEDESTRIAN ACCESS INTERIOR

8) PEDESTRIAN ACCESS SITE

9) ARENA SERVICING

10) TRANSIT RAIL SERVICE

11) TICKET PARKING AND DROP-OFF

12) CAUSEWAY DROP-OFF

13) GALLERIA

14) ATRIUM

15) COMMUTER RAIL STATION

16) GREEN LINE STATION

- Pedestrian circulation connections (8) provided 1) to Bulfinch Triangle by new west street, 2) to MGH site, river and potential air-rights parking north of ramps with 2 connectors to Nashua Street and due north from northwest corner.

- Arena servicing along Accolon Way at grade (9) and by ramp to arena floor level, with the actual solution dependent on the future of the Anelex building and the Central Artery project.

- Green Line station service access and North Station/commuter rail support access (10) in Accolon Way.

- Vehicular and bus drop-off and temporary ticket parking (11) at west end of arena via new loop street from Nashua to GSA service road.

- Vehicular and bus drop-off along Causeway Street at Atrium entry (12), new west street and Accolon Way.

Galleria and Atrium

Major circulation and waiting spaces to accommodate commuter rail, transit, arena, and general shopping circulation. The Galleria (13), considered joint MBTA and arena facility, should include:

- Floor raised 3' from street level to meet high-level train platforms.

- Escalators to arena mezzanine and concourse levels.

- Arena ticket sales at west end.

- North Station entrance and railroad tickets in center.

- Green Line/Orange Line Station at east end.

- Skylit roof above Galleria.

- Waiting areas for commuters, arena attendees or shoppers at edges within view of trains.

- Optional bridges from mezzanine of arena to mezzanine of development site by private developer.

The Atrium (14) connecting the Galleria to Causeway Street will serve as the primary entrance to the transit stations. It will be a dedicated right-of-way within the Garden development site. Lease or sale of the site will contain a covenant which defines and protects the Atrium as a permanent pedestrian right-of-way and requires the developer to construct and maintain the Atrium space.

- Atrium shall be skylit with a roof height no less than 40 feet and no higher than the Galleria roof.
- Width of the space will be a minimum of 60 feet and will satisfy the code for egress of the Galleria.
- Floor ramps up from Causeway Street to the three-foot height of the Galleria.
- Entrance shall be clearly articulated on the Causeway Street facade and be consistent with the facade guideline calling for a continuous Causeway Street facade.
- Seating and landscaping are encouraged, and treatment should be similar to and compatible with the Galleria.
- Atrium frontage should be used for retail.
- Market type retail in the Atrium can be considered with approval of the MCCA. It should not constrict movement to the Galleria.

Commuter Rail Station

The present North Station will be replaced by a new commuter rail station (15) between the Galleria and the rail tracks and platforms. While the final transportation improvements program has not been articulated prior to completion of this Feasibility Study, several objectives and parameters were described by the MBTA and its consultants. Final station design should conform to the final MBTA program.

- Station location will be determined by the end location of the tracks and platforms. The arena phasing and design are such that a minimum distance of 35 feet is desireable if train switching functions permit. Furthermore, a slightly bowed configuration of the rail heads is recommended to allow for optimal circulation space as shown in the ground floor plan.

- Visual continuity from Atrium and Galleria to the tracks is recommended.
- Five ticket stations are required in an easily accessed location near the entrance.
- Multiple continuous doors are recommended from Galleria to station area for peak period surge loading and ease of access.
- Waiting areas and seating would take place in the Galleria and Atrium within view of the trains.
- The platforms and station area would not be fully heated or air conditioned because the north end of the platforms would remain open.
- Design must be coordinated, reviewed and approved by the MBTA and MCCA.

Green Line Station

The proposed relocation of the Green Line includes a station at the east end of the galleria providing a direct covered connection from Green and Orange Lines to North Station and the Arena.

- Green Line station area at grade adjacent to the Galleria could be owned outright or leased from the MCCA by the MBTA.
- Entrance to the station shall be open and continuous from the Galleria.
- Natural lighting for the Green Line platforms is encouraged if it can be provided by the design of the air-rights development.
- Adequate queuing space, surge loading capacity, and egress units are required according to MBTA standards.

Design Process

The proposed arena is of necessity a joint development project. Because of the mixture of uses and responsibilities on the ground floor and potentially on the arena floor or mezzanine level, the design process for the different components of the arena needs to be carefully coordinated between the MCCA, MBTA, BRA, private developer, and the city building agencies. Code analysis must consider the full range of uses and loading characteristics. If the project is done with construction management from the outset, the manager would be responsible for such interagency coordination. Responsibilities for cost sharing, maintenance and upkeep will have to be assigned parallel with the design process.

DEVELOPMENT SITE GUIDELINES AND SCENARIOS

Purpose and Implementation

The intention of development site guidelines is to provide two levels of design control for the private developers: 1) design requirements and responsibilties for arena and MBTA-related facilties and 2) recommended design guidelines for making the project compatible with the arena, MBTA facilities and surrounding context. The design requirements are those which the Study Team recommends for the proper functioning of the arena and transit facilities and focus on the ground level space allocations and circulation patterns. The recommended design guidelines suggest ways in which private development can best complement the arena design. It is expected that the MCCA and BRA would prepare detailed guidelines and a developer's kit for the site when the transportation projects are clearly defined to insure a project which is compatible with development policy for the district. It should be noted that the eventual zoning and design guidelines may also become required, but cannot be stated as such until city policy is finalized. Implementation of design guidelines would depend on the final disposition of the property by the MCCA. The requirements, guidelines and design review process would be a part of the lease or sale agreement.

Developer Requirements

The following design requirements and developer responsibilities are necessary for the proper functioning and interface with the Galleria and the related arena and MBTA elements.

1) Atrium: construction, maintenance and use of the Atrium.

2) Galleria interface: responsibility for construction or adaptation of south Galleria wall to correspond to arena design.

3) Arena ticket booth: reserve and build shell space to be owned by arena for ticketing in north west corner of development parcel, facing the Galleria.

4) Green Line station: reserve space for MBTA construction with direct, easy access.

5) Building setbacks: building line on Causeway Street to be held at face of GSA building; on Accolon Way building face corresponds to east face of arena; on new pedestrian street building face corresponds to west face of arena.

6) Servicing: service docks to be accessed from Accolon Way and the new pedestrian street at grade.

7) New pedestrian street: between GSA and developer site/arena a 70-foot wide pedestrian street will be built and maintained by developer as public easement. Limited service and vehicular traffic is possible. Street portion (22 feet wide) to be located near GSA building leaving maximum pedestrian width along new building edge.

8) Access to underground parking: ramp to parking, if any, built below grade to be located in new street at middle of development parcel on west side.

9) Articulated entrances: primary central atrium entrance with separate entrances for two office sites. Emphasizes Causeway Street addresses for offices separately from arena and train station.

10) Arcade: design to incorporate a 12-foot deep arcade continuously along Causeway Street and 10-foot arcades on Accolon Way and the new pedestrian street along the western side of the arena. Arcade provides weather-protected walk to Galleria, Atrium, office towers, and connecting entrances.

Recommended Design Guidelines for the Development Site

The following guidelines are subject to review and refinement depending on final BRA and City policy for the district and the specific development parcel. The recommended guidelines are based on analysis of the arena needs as well as assessment of the current context.

The guidelines assume construction of the three transportation projects and removal of the Green Line elevated.

1) Development program and zoning revisions: Assessment of the site capacity and market potential suggest the feasibility of a total development package of approximately 600,000 square feet, a density roughly equivalent to that of the adjoining GSA site. It is recommended that the zoning for the site (either the development site alone or the combined development and arena sites) reflect this density. Proposed land-use would include retail on the lower two floors with commercial office space above. A limited amount of parking (approximately 400 spaces) could be provided below grade, if it does not conflict with other grade level uses.

2) Building Configuration: The site consists of two parcels connected by the Atrium. The character of buildings in the Bulfinch Triangle suggests the desirability of the following configurations along Causeway Street.

o Continuous base facade 70' to 80' high along Causeway Street lined up with the GSA building. It should be of a scale and materials consistent with buildings on the south side of Causeway Street.

o Two separate buildings set back from continuous facade by 10-15' to emphasize lower facade. Scale and materials similar to base. Floor area of 16,000 to 18,000 square feet. Maximum total height of 20 stories or 240 feet.

o Elevation treatment should emphasize the vertical rather than horizontal proportions, as does the current Garden and older Bulfinch Triangle buildings.

o Roof area between buildings, excluding the Atrium skylight, can be decked and landscaped for use and visual enjoyment by those who work in the office buildings.

3) Open Space will be provided in several ways:

- Pedestrian street between GSA and development would be landscaped and treated as an open space similar to Downtown Crossing in Boston.
- The Atrium and Galleria spaces would be treated as interior courtyards, with landscaping, seating and special treatments appropriate to the train station functions.

DEVELOPMENT SCENARIOS

The three development scenarios represent different policies regarding development density (zoning and floor area ratio) and transportation projects. Each scenario maintains the development site mandatory requirements for the ground floor. Site guideline diagrams are shown for each as well as the illustrative design for the recommended approach.

Recommended Approach: Scenario 1

Full site development guidelines with two commercial office/retail buildings and a continuous Causeway Street facade are shown in Figure 8-12. The approximately 600,000 sq. ft. development is divided into independent buildings whose construction could be phased. The bases of the buildings will be oriented toward the Atrium to create a focus. The 16-20 story height is enough to establish identity and views but would not be overwhelming to the local context in scale or massing. There are, obviously, many alternative ways to articulate the two buildings.

The illustrative design shown in Figure 8-13 gives an example of how the guidelines might be applied to a specific design.

Alternative Devlopment Scenario 2:

Two buildings with existing Garden facade (Figure 8-14) shows a different building configuration because the ground level plan would be limited to the existing Garden footprint. This scheme would be appropriate if a developer wanted to provide literal historic continuity on the site by retention of the Garden facade. It would require an altered Atrium plan and a means for getting enough light through existing Garden openings. The building setback on Causeway Street would remain at the present Garden facade location. This approach, similar in concept to the 50 State Street project, would be more expensive than all new construction.

FIGURE 8-12
SCENARIO 1 : DEVELOPMENT SITE GUIDELINES - TWO BUILDINGS

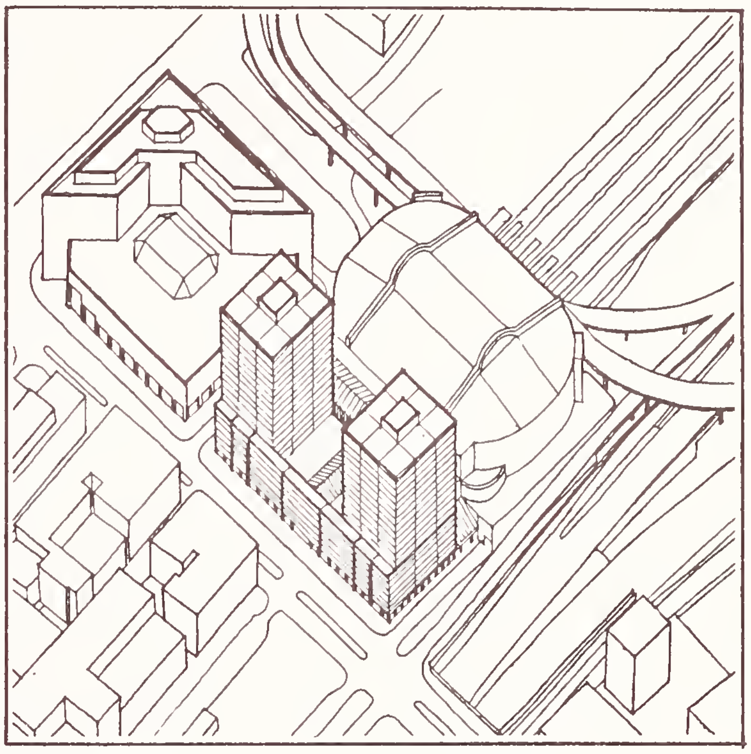


FIGURE 8-13
SCENARIO 1 : PREFERRED ILLUSTRATIVE DESIGN - TWO BUILDINGS

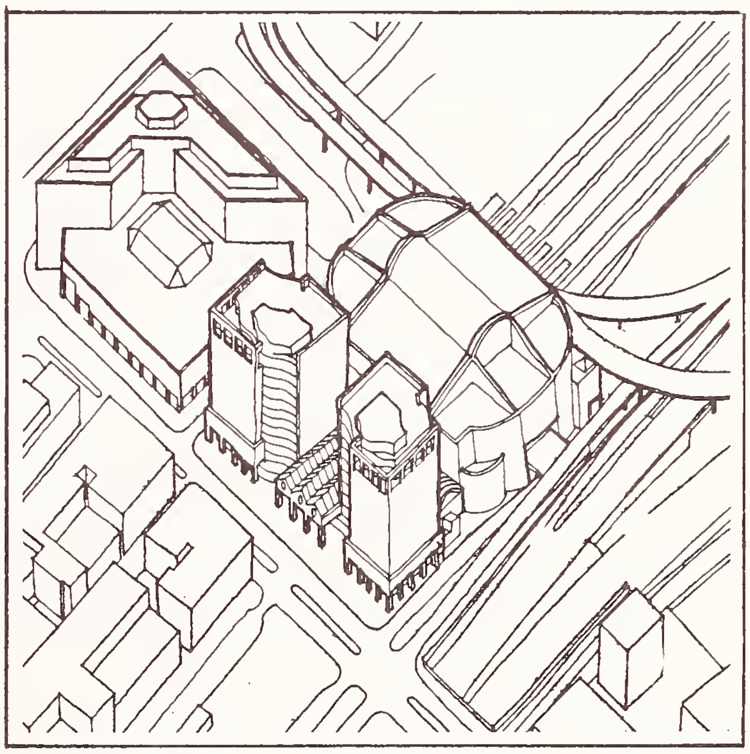


FIGURE 8-14
SCENARIO 2 : TWO BUILDINGS WITH EXISTING BOSTON GARDEN FACADE

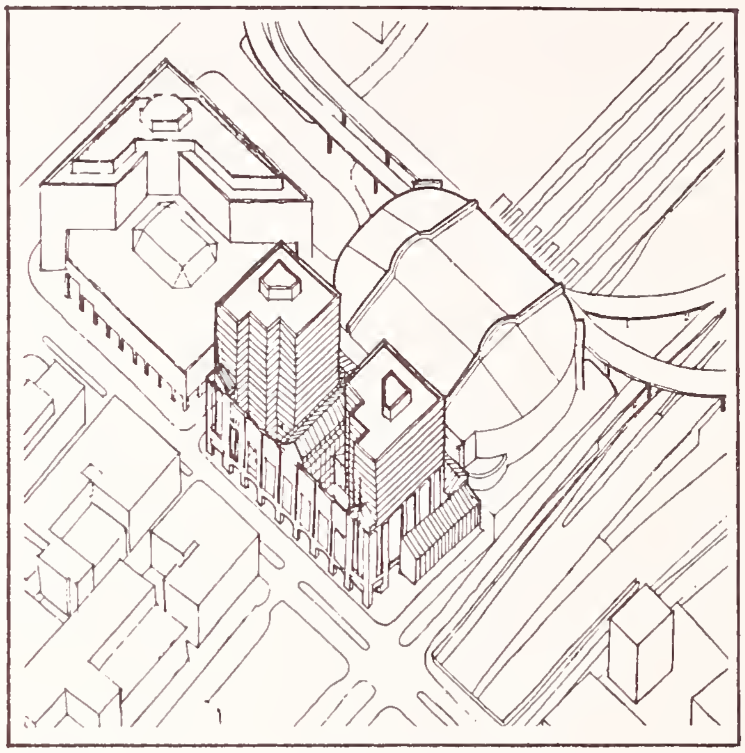


FIGURE 8-15
SCENARIO 3 : SINGLE BUILDING

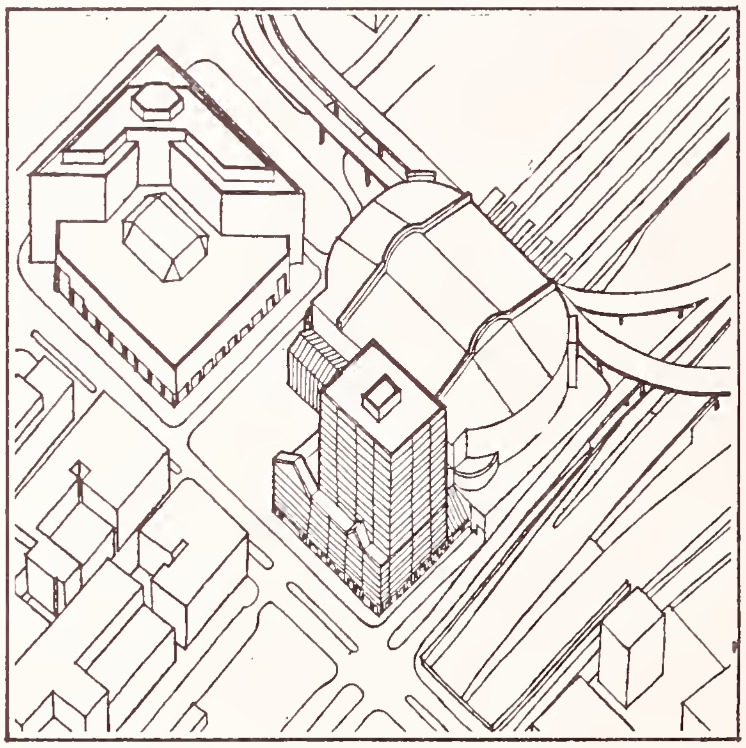
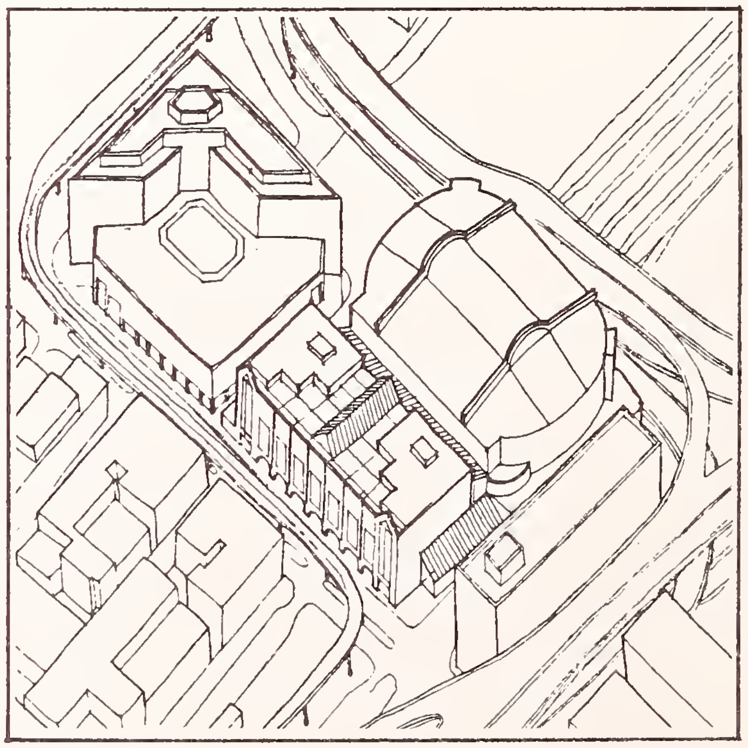


FIGURE 8-16
SCENARIO 4 : RE - USE OF BOSTON GARDEN SHELL



Scenario 3:

Single building (Figure 8-15): This scenario is based on a lower density of development if city policy and zoning were to allow only 400,000 sq. ft. A single building of 20 stories with a footprint of 20,000 sq. ft. would be developed on the east end of the site, leaving the west end open. Galleria and Atrium spaces would be included, but their architecture would have to reflect their exterior exposure. This approach is a response compatible with both transportation projects. The disadvantage of the single building concept is that it exposes a large portion of the arena at the west end, generates an open space which may receive little use, does not relate well to the fabric of the Bulfinch Triangle area, and is an under-utilization of an important transportation node. Given the importance of the transportation elements on this site, a solution which places major open space inside the building is preferred. Causeway Street has traditionally had a large continuous facade blocking the ends of feeder streets.

Scenario 4:

Adaptive Reuse of the Garden Shell (Figure 8-16): would be the most plausible development of the site if the Green Line project did not occur and the elevated remained in Causeway Street. The presence of the "el" precludes full site development as office space because of the poor image and environment of the street. Possible scenarios for re-use of the Garden might be a trade mart, specialized market space, or retail mall with a mixture of other office and restaurant uses. The Atrium and Galleria would be carved out of the Garden and the Green Line station would not be built. Because of the existing structure, the Garden would need to be substantially gutted and restructured for the new uses. While historic continuity would be better than other options, the general feasibility of such a re-use is questionable. The scheme is not recommended but illustrates the problems of the site with the Green Line elevated remaining in place.

ENVIRONMENTAL IMPACT ANALYSIS

Environmental Impact Review Process

EIR/EIS Requirements

The complexity of the arena project, its public uses, and the anticipated impacts on the site and its surroundings will most likely require an Environmental Impact Report (EIR) process for the Massachusetts Executive Office of Environmental Affairs through regulations governing the Massachusetts Environmental Policy Act (MEPA). In addition to the State EIR requirements the arena project would probably have to participate in portions of the Federally required Environmental Impact Statements for both the Central Artery reconstruction, the Green Line relocation and the extension of commuter rail tracks. In addition to and in support of these required impact assessments, it is recommended that a community process be instituted in the form of a series of Citizen Advisory meetings. The purpose of such an information exchange process would be to discuss thoroughly and openly with a representative group from the North Station area and neighboring residential districts as well as users, the design of the arena complex, its functions, its impacts and mitigation measures. The dialogue should strive for a concensus agreement on both construction phase and longer term impact mitigation.

For the state required EIR process a fully qualified consultant would be needed to assist in its preparation. The process would consist of the following steps, based on recent experience with the Hynes Auditorium expansion EIR:

- DEIR Presentation.
- Submission of DEIR comments by agencies, businesses, residents, users and other concerned citizens.
- Development of measures to mitigate negative impacts, if any.
- Incorporation of measures into DEIR.
- Citizen Advisory group meetings to discuss mitigation.
- Submission of comments on mitigation.
- DEIR submission to MEPA.
- MEPA review and comment.
- Final EIR submission.

Because of the transportation components of the existing and proposed projects, portions of the arena project would also be likely to fall under the jurisdiction of the National Environmental Protection Act (NEPA).

The federally required EIS for the transportation projects would be conducted by the DPW and MBTA for their respective projects in conjunction with the Boston Redevelopment Authority. Steps in these EIS processes would be determined at the time of funding with the Federal agencies involved. It is also possible that a single EIS might be prepared by the BRA and State for all projects in the North Station district in support of a coordinated redevelopment plan for the area.

Summary of Key Environmental Issues

Based on the items contained in the state required Environmental Notification Form, there appear to be several areas of impact that would require particular attention. They include, but may not in the final design be limited to, the following:

- Parking and Traffic: parking and traffic impacts will depend on trips generated, highway connections, to state and city plans and policy. Modal split analysis should be provided in respect to transit improvements.

- Open Space and Recreation: given the limited amount of existing open space and a very tight site, the effectiveness of open space utilization should be evaluated.

- Geologically Unstable Area: because of the soil conditions, high water table and filled land, impacts of new construction on the site and surrounding structures would have to be evaluated.

- Energy Consumption: the increased site development and density would require a thorough energy analysis and design response.

- Contribution to Sanitary Sewage: while the levels will not change significantly from those of the existing Garden, analysis of peak loading on the existing and proposed systems is needed.

- Air Quality: analysis of emissions from arena and transit components based on the final design should be assessed. In addition, increases in traffic and auto emissions should be included.

- Noise: construction noise and vibration impacts require analysis, based on final design and phasing.

- Aesthetics: historic continuity, massing, materials, detailing and site planning need to be evaluated with respect to the Bulfinch Triangle to the south of the site.

EIR Outline

The following outline for a Draft Environmental Report is provided as a guideline for the consultant and reflects the process recently used for the Hynes Auditorium.

Draft Environmental Impact Report Outline

1.0 COMPLETED FEE

2.0 SUMMARY SHEET

2.1 Name of Project and Brief Description
2.2 State ID Number
2.3 Name of Proponent
2.4 Status of Environmental Impact Report
2.5 Jurisdiction Affected
2.6 Summary of Major Benefits, Costs and Impacts of the Project

3.0 PROJECT DESCRIPTION

3.1 Site Description
3.1.1 Site Location
3.1.2 Existing Structures
3.2 Project History and Status
3.2.1 History of Existing Building and Need for
3.2.2 City of Boston
3.2.3 Massachusetts Convention Center Authority
3.2.4 Current Status of Design
3.3 Purpose and Objectives of the Project
3.4 Description of the Proposed Development
3.4.1 Project Characteristics
3.4.2 Exterior Appearance
3.4.3 Access
3.4.4 Future Operational Program
3.4.5 Relationship to Other Projects
3.6 Description of Citizen's Advisory Group
3.6.1 Purpose of the Advisory Group

PROJECT DESCRIPTION (CONTINUED)

3.6.2 Advisory Group Organization
3.6.3 Advisory Group Membership
3.6.4 Meeting Schedule

4.0 DESCRIPTION OF THE ENVIRONMENT OF THE AREA

4.1 Land-Uses Abutting the Site
4.2 North Station District and Bulfinch Triangle

5.0 ALTERNATIVE TO THE PROJECT

5.1 Preferred Alternative
5.2 Evolution of Current Design
5.2.1 Past Arena Concept Designs
5.2.2 Garden Renovation
5.2.3 Current Design
5.2.4 Preliminary Design Phase
5.3 No Build Alternative

6.0 POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

6.1 Transportation and Parking
6.1.1 Description of the Transportation System
6.1.2 Impact Analysis
6.2 Parking
6.2.1 Existing Conditions Surrounding North Station
6.2.2 Future Parking Conditions
6.2.3 Measures to Mitigate Parking Impacts
6.3 Pedestrian Access
6.3.1 Existing Conditions
6.3.2 Future Conditions (including arena and transportation uses)
6.3.3 Mitigative Measures
6.4 Wind Impacts
6.4.1 Boston Wind Data
6.4.2 Urban Wind Characteristics
6.4.3 Future Wind Conditions
6.4.4 Mitigative Measures
6.5 Scale and Aesthetics
6.5.1 Existing Garden and North Station
6.5.2 Proposed Arena and North Station
6.6 Historic Property
6.6.1 Potentially Affected Historic Resources
6.6.2 Potential Impact of the Project
6.7 Sewage Generation and Reduction
6.7.1 Existing Sewage Discharge
6.7.2 Future Sewage Discharge

POTENTIAL ENVIRONMENT IMPACTS AND MITIGATION MEASURES (CONTINUED)

6.8 Construction Impacts
6.8.1 Construction Schedule
6.8.2 Construction Worker Parking
6.8.3 Equipment and Materials Staging
6.8.4 New Pilings and Excavation
6.8.5 Dust and Noise Controls

7.0 APPENDICES

Appendix A MEPA Scoping Letter
Appendix B Biography of Studies and Reports
Appendix C Preliminary Design Summary
Appendix D Citizens Advisory Group
Appendix E Traffic Data and Parking
Appendix F BRA Urban Design Guidelines and Comments
Appendix G Climatological Data

REAL ESTATE CONSIDERATIONS

9

REAL ESTATE CONSIDERATIONS

9

Summary of Work Performed

Real Estate analysis for the Feasibility Study consisted of estimating the acquisition costs of the real estate required to build the new arena at North Station. The site is currently under private and City ownership, and therefore will require the MCCA to assemble the required parcels by use of eminent domain. Another primary real estate consideration was the analysis of the development potential of the excess parcel between the Galleria and Causeway Street.

Current Ownership of Property

The proposed new arena site, consisting of four separate parcels, is situated in the vicinity of the existing North Station/ Boston Garden Complex as shown in Figure 8-2. The majority of the ownership includes a City of Boston vacant parking lot situated between Boston Garden and the highway ramp. This site contains approximately 130,000 square feet and is currently under lease to Owl Parking Company, No. 2. This site currently has the capacity for 360 cars.

The lot is subject to two easements; one to the Boston Garden Corporation for access onto the site from fire escapes, the second easement to the MBTA/Boston & Maine Railroad to provide access across the site from the North Station commuter rail facility to the trains which terminate presently at the northerly edge of the subject site.

The second major parcel is comprised of the existing Boston Garden/North Station complex. This property includes approximately 88,642 square feet of land which is improved with the Boston Garden Arena Structure. The third parcel incudes a narrow irregularly shaped tract containing approximately 9,900 square feet which is a portion of a large vacant parking lot owned by Massachusetts General Hospital. This site is situated between the City of Boston parking lot and the highway ramp, at the northwest corner of the arena site. There is also a fourth parcel which consists of a portion of Accalon Way.

Required Acquisitions

In order to construct the new arena it will be necessary to acquire the four parcels previously described. The estimated cost of acquiring this property is outlined as follows:

City of Boston Parking Lot: This 360-car parking lot is presently under lease to Owl Parking Company, No. 2 for a one-year term commencing October 1, 1983 at an annual rent of $761,319. Owl Parking Company was awarded the lease as successful bidder. The next two highest bidders were Alright Boston Inc. at $672,650 and Kinney Systems of Boston Inc. at $637,500. This lease is awarded annually. In the future it is expected that annual revenues to the City should range in the vicinity of $750,000 - $800,000. In light of this situation, it was concluded that the total cost to acquire this parking facility would be approximately $8,000,000. This is the figure used in the financial analysis of the arena's total project cost; it may be possible to share this acquisition cost between the MBTA and MCCA.

Boston Garden: The existing Boston Garden/North Station complex is owned by the New Boston Corporation. Major tenants in this facility include the Bruins and Celtics. For purposes of analyzing the value of this property, it was assumed that the faciltiy will be maintained at the same level as at present and that no substantial structural changes or life safety requirements would be required as a result of changes in building codes or other unforessen statutory requirements. The property presently is in fair condition and is functioning as an arena, although at a questionable level of quality. Both the Celtics and Bruins have continuously operated in this faciltiy for the last several years and are expected to continue operation here for the foreseeable future.

In estimating the present value of this property, financial information was obtained from the present owner, the New Boston Garden Corporation, as furnished to the Study Team. In addition, information was obtained from public records and investigations and analysis were conducted.

In addition to financial information provided by the New Boston Garden Corporation, building plans furnished by the owner were also reviewed, as well as information obtained during an inspection of the property conducted on April 11, 1984.

The principal method of estimating the value of the existing property was by means of the income approach. In this analysis, the estimated gross revenue attributable to the real estate was estimated, as well as operating expenses in order to arrive at a realistic estimate of net income. This net income was then capitalized into value utilizing an overall rate. This resulted in an estimated value which reflects the value of this property for its continued use as an arena. This is considered to be the highest and best use of this structure.

Gross income attributable to this real estate is derived from event revenues, concessions, advertising, programs, skybox revenues, rent from tenants in the building, including restaurants/clubs and general tenant space. Expense revenues include event cost, which is the attributable cost of hosting the event, direct building expenses and general and administrative expenses. The estimated expenses do not include non-operating costs such as interest costs, depreciation or income taxes.

The information furnished by the owner indicated that for fiscal 1983 net income attributable to the real estate amounted to approximately $1,300,000. This estimated revenue is a result of management of this property under the New Boston Garden Corporation. A review of this operating history in light of industry standards and "armslength" agreements between a building concession owner and major tenants indicate that a net revenue attributable to the real estate could be in a range of $1.8 to $2 million (see Chapter 4). Of this amount it has been estimated that $500,000-600,000 represents annual rental income from sixteen retail tenants in the building.

Utilizing these net income estimates and an overall capitalization rate of 14 percent indicates a value for this real estate from a low of $9.3 million under present management to $14.3 million. The higher amount reflects average industry standard "armslength" agreements. Therefore, as a result of this analysis, it was concluded that the estimated market value of this real estate as of June 1984 was approximately $14,500,000.

Massachusetts General Hospital Land: The small portion of the Massachusetts General Hospital land which would be acquired includes approximately 9,900 square feet. The value of this land has been estimated at $50 per square foot or a total value to acquire this property of approximately $500,000.

Accolon Way: Accolon Way is an alley which is situated at the extreme easterly portion of the site between the existing Boston Garden/North Station Complex. It is possible that this property will be taken as part of the Central Artery project's land taking, and given the unknown ownership, no value for this parcel is being assigned at this time.

The total estimated cost of all property to be acquired for the new arena site as identified is approximately $23,000,000.

Easements/Joint Development:

As part of the arena development, the Massachusetts Bay Transportation Authority would incorporate a new commuter rail station on the ground level of the subject site. It is proposed that a new arena itself would be constructed on air rights over the new rail station. For purposes of the Feasibility Study's financial analysis of a new arena, it was assumed that the underlying land would be owned by the MCCA. This will necessitate the granting of a permanent easement by the Massachusetts Convention Center Authority to the MBTA. In this case, the MCCA would retain the air rights over the commuter rail station for the construction of the arena. The easement area required is approximately 60,000 square feet. The value of this easement area has been estimated at approximately $3 million, which represents approximately 75 percent of the underlying land value attributable to this portion of the site. Payment by the MBTA for this easement area would help reduce the overall acquisition cost to the Authority for this site. In addition, the MBTA will require easements within the main concourse/galleria area to provide access to the commuter rail station and escalator access to the Green and Orange Line Rapid Transit Stations. These easements have not been fully identified, and no reimburse-ments/fees from the MBTA to MCCA have been estimated.

Development Scenarios and Strategies

Completion of the new arena building and demolition of the existing Boston Garden will result in the creation of a development site which will be situated in front of the new arena building with frontage on Causeway Street. This development site consists of surplus land not needed for the new arena building. It offers a significant opportunity for joint-use development combining private commercial use directly with a major transportation center and arena structure. As preliminarily designed, the private commercial development would offer an important presence to the neighborhood, masking to a large degree the bulk of the arena structure and at the same time creating a landmark identity. Private commercial use at this location should also help significantly the revitalization of this neighborhood.

No specific determination has been made as to what development density or design criteria would be allowed by the City. However, for purposes of this analysis the Study Team has concluded that this development site would be capable of supporting two 20-story tower buildings containing 300,000 square feet each for a total development potential of approximately 600,000 square feet. Each building could be developed independently and both could be connected to the main entrance galleria, the arena, as well as the MBTA subway and commuter rail stations. It is understood that any development of this site offers opportunities for BRA participation in the development process.

This private office development site could be sold outright by the Authority or leased on a long-term basis. The value of the site has been estimated at approximately $12,000,000, assuming a total of 600,000 square feet can be constructed. On a lease basis the annual rental would be a minimum of $1,200,000.

The outright sale of the development parcel has the advantage of directly reducing the project cost for the new arena, thereby reducing the total capital expenditure which would be required. On the other hand, a lease of this site would produce an annual revenue, which could be utilized to help reduce operating expenses and debt service. Either scenario has a significant net benefit to the Authority.

An office/retail development of 600,000 square feet would produce an annual real estate tax revenue to the City of Boston of approximately $2,400,000. In addition, it would generate a one-time linkage payment to the City of approximately $2,500,000. Another significant economic consideration is the fact that approximately 3,000 people would be employed within the private development, which would contribute to the demand for additional business and service use within the neighborhood.

REVENUE AND EXPENSE PROFILE

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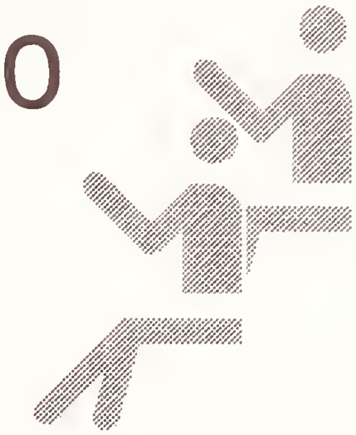

CLOWN MAKE-UP KIT
CLOWN FACE
RINGLING BROS. BARNUM & BAILEY
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REVENUE AND EXPENSE PROFILE

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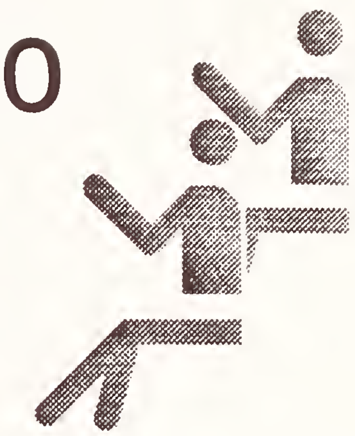

INTRODUCTION

This section describes the assumptions used in developing a profile of revenues and expenses that could be associated with a new arena at North Station. The profile has been prepared for purposes of planning for the implementation of a new arena and for analysis of financing alternatives that may rely on the financial results from arena operations. The assumptions are based upon the information gathered in the Industry Overview task, the proposed design of the new arena as presented in Chapter 7, and the Study Team's industry experience as it relates to arena operations.

EVENTS AND ATTENDANCE

The profile of revenues and expenses was completed using assumptions from the analyses concerning potential events and attendance as presented in Chapter 2. The "Baseline" profile assumes that approximately 240 events would be held in a new arena and 2,811,000 patrons would attend those events. A more detailed explanation of the individual event types is contained in Chapter 2 of this report.

TOTAL REVENUES

Revenues were estimated by event type. The types of revenue are:

- Rental Revenue/Admissions
- Concession Income
- Expense Reimbursement
- Other Event Income
- Non-Event Revenue

Rental Revenue and admissions are the arena's share of the gross ticket sales for an event. There are two major categories for event types at an arena: (1) events that are promoted by an entity or person other than arena management and, (2) events that are promoted or co-promoted by arena management.

The amount of gross revenue reported by the arena for the two event types is substantially different. For events promoted by outsiders, only the arena's share of those revenues is reported (typically 11-15% of gross ticket sales). For events promoted or co-promoted by arena management, the entire gross ticket sales amount is reported in the Rental Revenue/Admissions line item. This is then offset by "Licensee Participation Fees - Other" which is the co-promoter's or "act's" share of the gross ticket sales. Licensee participation fees are further explained below.

The estimation of rental revenue has been based on information gathered from the Industry Standards questionnaire responses, interviews, and arena site visits.

In the case of the Celtics and Bruins, contracts are signed for a number of seasons. The arena's portion of ticket sales for the two teams is based on typical industry agreements.

Other users of the arena are assumed to be contracted on an annual or per event basis. The rental revenue for these events is based on an analysis of typical industry agreements.

Total ticket sales for college sports is included in rental revenue because it is assumed that management will promote all of these events. Significant portions of ticket sales for other events are also included in rental revenue in proportion to the assumed number of co-promoted events. These revenues are offset by "Licensee Participation Fees" which are explained in the Total Expense section, below.

The assumed average ticket prices by event type for a new arena are shown in Exhibit 10-1.

Concession Revenues are based on an analysis of industry agreements and interviews with arena managers and major concessionaire representatives. The per capita revenue for each type of event is multiplied by the total attendance for that type of event.

Expense Reimbursement is often included in arena rental agreements. Certain renters agree to reimburse an arena for the direct expenses incurred as a result of their events. It is assumed that the new arena will offer certain events with this arrangement.

Other Event Revenues includes all revenue items not included in the major categories described above. It is assumed to that other revenues would be similar to profiles of other facilities in major markets and have been projected on that basis.

Other Income includes concourse suite rentals, advertising, restaurant, and club revenues.

- Concourse suite revenue has been based on the planned number of suites at an average annual rental amount. The current plan includes 27 concourse suites containing an average of 16 seats each. Based on industry profiles, it is assumed that the suites would rent for $40,000 per year in 1984 dollars. This rental fee does not include the price of tickets.

- Advertising revenues include scoreboard advertising and the leasing of in-house display space. It has been based on industry profiles for major markets. It is assumed that the arena would generate over $1 million in advertising revenue in 1984 dollars.

- Restaurant and club revenues are based on expected usage per event and a certain amount of lunch business since related private development and the existing GSA Building offer significant daytime customer traffic in the immediate area.

TOTAL EXPENSES

Arena operating expenses include those expenses that are directly related to events as well as costs that are necessary to overall operations but cannot be directly attributed to events.

Event and non-event expenses were estimated using the event and attendance mix from the Market Potential results discussed in Chapter 2 and the information related to arena operations in major markets gathered in the Industry Overview work described in Chapter 1.

Event-Related Expenses

Salaries and Payroll-Related expenses represent approximately 30 percent of event related expenses. This component of expense has been estimated based on staffing patterns at other major market arenas, adjusted for differences in regional labor rates and building design characteristics of the proposed arena.

Outside Security represents services for certain security requirements at major market arenas that are commonly contracted from outside firms. The amounts were calculated on a per event basis with appropriate variances for the different event types. The total amount is calculated by multiplying the per event amount by the assumed number of events.

Maintenance is the materials and supplies portion of maintenance requirements that are a direct result of events. The salary portion of event-related maintenance is included in the payroll-related event expense category, explained above. This cost has been calculated on a per event basis based on the industry profile for similar costs.

Licensee Participation Fees represent portions of the arena's revenue that are shared with the licensee (or co-promoter). The greatest portion of these expenses is the licensee share of gross revenues for those events promoted by the arena. Also included is a portion of the arena's gross share of concession revenues which has been allocated back to the Celtics and Bruins as part of their overall rental agreement. This practice varies widely in the industry and is currently not done at the Boston Garden. The assumed percent of arena concession revenues shared with the Celtics and Bruins is based on the concession sales at their respective events and the overall concessions sharing arrangements which are representative for a major market facility such as Boston.

Other Event Costs are all of the remaining expenses associated directly with events. They have been projected on a per event basis by type of event based on Industry Standards information and the Study Team's industry experience. The total Other Event Costs and all of the event-related expenses previously discussed will vary with a change in the event mix.

Non-Event Expenses

Non-Event Expenses represent all of the remaining operating expenses that cannot be directly attributed to a particular event or event type. A summary of non-event expenses is presented in Exhibit 10-2. The categories are as follows:

Administration expense includes the arena manager, the administrative support staff and the finance and accounting staff.

Admissions includes the fixed expense portion of the admissions-related activities (such as supervision of ushers and ticket takers) that can not be charged directly to a specific event or group of events.

Box Office is the ticket sales function and includes the arena sales office and fees paid to independent ticket agencies.

Operations expense is the fixed cost component of total operations and maintenance functions and includes a large salary component for full-time personnel and includes all utilities expense.

Scoreboard expense is the full-time personnel and supplies required to operate the variable programmable message display scoreboard planned for the arena.

Marketing, Public Relations, and Group Sales are the overall administrative marketing functions and include personnel and advertising components which cannot be associated with individual events.

Payment in Lieu of Taxes ("PILOT") is an expense provision for the amount that the City of Boston would otherwise lose in property tax revenue due to the public ownership of the new arena. The "PILOT" expense (to be paid to the City) is approximately equal to the amount of property taxes currently paid by the Boston Garden. The Commonwealth is not obligated to make arena-related PILOT payments to the City. The actual amounts paid, if any, would be subject to future negotiations.

Other non-event expenses include all miscellaneous cost items not included in the categories mentioned above.

The largest cost element within all non-event activities is personnel-related expenses. This represents approximately $2,700,000 in 1984 dollars for a new arena in Boston, or approximately 45 percent of all non-event expense. Personnel-related expenses are based on expected staffing and salary levels and information gathered in the Industry Overview activities.

Utilities costs, included in operations expense as described above, were based on estimates of natural gas and electric consumption developed by the Study Team. All other non-event expenses are based on industry profile information for major market facilities.

OTHER CASH SOURCES OR REQUIREMENTS

Replacement Reserve Provision: The Study Team has provided for an annual amount to be set aside out of arena operating cash flow for the purposes of accumulating a fund to pay for future repairs, major equipment replacements, or facility upgrades. This annual provision is similar in concept to the annual depreciation expense recognized in all privately owned enterprises. The creation of such a repair and replacement fund would eliminate the need for further borrowings or taxpayer expenditures whenever significant arena capital improvements are needed. The derivation of the annual replacement reserve provision for the new arena is shown in Exhibit 10-3.

Lease Proceeds From the Development Parcel represent a source of non-operating revenue to the arena, assuming ownership of the land parcel fronting on Causeway Street is retained by the State. The basis for the estimated annual land lease payment of $1,200,000 in 1984 dollars was described in detail in Chapter 9, Real Estate Considerations.

SUMMARY REVENUE AND EXPENSE PROFILE

The estimated revenue and expense profile for a new arena at North Station, including other cash requirements or sources, is shown in Exhibit 10-4. As shown in Exhibit 10-4, the Study Team estimates that the new arena would generate approximately $4.4 million per year from operations by 1992, the second full fiscal year of arena operation and the first full year after completion of the full development project. Total arena cash flow, including the replacement reserve provision and lease proceeds from the development parcel, is estimated to be approximately $2.9 million per year in 1992.

PROJECT COSTS

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PROJECT COSTS

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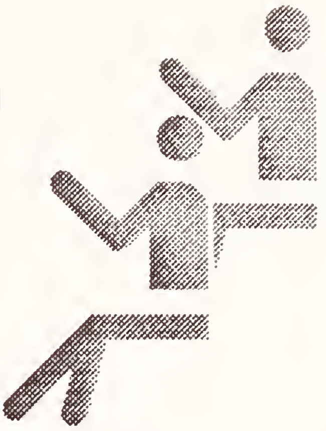


Construction Cost (in 1984 dollars)

Based on the design concept and an outline specification developed for a new arena at North Station, construction costs were estimated using mid-1984 prices. The initial cost estimating process assumed that normal lump-sum public bidding procedures with a general contractor were being used.

The mid-1984 construction costs for a new arena, broken down into the four phases as described in the following chapter is as follows:

o Phase I (sub-grade and arena floor)	$25,000,000
o Phase II (arena)	$60,000,000
o Phase III (Garden demolition)	$ 2,500,000
o Phase IV (Galleria-MCCA portion only)	$ 1,500,000
TOTAL CONSTRUCTION COST	$89,000,000

A breakdown of the costs of each phase according to the 16 Construction Specifications Institute (CSI) divisions is shown in Exhibit 11-1; additional cost estimating detail is found in the Appendix.

Equipment and Outfitting

In order to facilitate analysis of the possibility for alternative sources of equity contribution to the capital program, selected arena equipment was costed out separately as indicated below:

o Restaurant Outfitting, and Finishing	$1,000,000
o Scoreboard, Wiring, and Controls	325,000
o Concession & Vending Areas	
- Finishes	250,000
- Equipment	300,000
- Display Cabinets	50,000
o Private Suites - Finish Work	360,000
o Radio and Television Press Box - Finish Work	75,000
o Home Locker Room Finishes	280,000
o Training Room Equipment	100,000
o T.V. and Radio Equipment Room	55,000
Total Equipment and Outfitting for possible private sector participation	$2,795,000

In addition to the $2,795,000 in equipment costs shown above, $1,355,000 of equipment which is not likely to be funded by the private sector is included in the base building cost estimate previously described.

Property Acquisition

As discussed in Chapter 9, there are several property acquisitions necessary for the construction of the new arena at North Station. The total gross property acquisition costs, as discussed in Chapter 9, would be approximately $23,000,000 (1984 dollars). For purposes of the initial analysis to identify gross acquisition cost before possible MBTA participation, this figure assumed that the MCCA paid the full amount for the City of Boston parcel north of the Garden area although its use would be shared by the MBTA. Similarly, the figure for the Boston Garden acquisition reflects gross acquisition cost before demolition and possible resale as a development parcel.

o City of Boston Parcel	$ 8,000,000
o Boston Garden	$14,500,000
o Massachusetts General Hospital	500,000
Total Gross Acquisition Costs	$23,000,000

Final Design, Engineering and EIS Fees

For a project of this magnitude a professional fee of 5% of the construction cost was assumed.

Contingency Costs

The base 1984 construction costs described above include contingency allowances. Given the complexity of the project, it is advisable that an additional overall project contingency figure of 5% be included in the analysis of total project costs.

Construction Management

As described in the previous chapter, use of a Construction Management approach to this project can result in mid-1984 construction cost savings of approximately 12% over conventional lump sum general contractor bidding. The comparative effect of this savings in the mid-1984 dollar cost estimate is shown in Exhibit 11-2.

Furthermore, the Construction Management approach can shorten the total construction cycle and thereby reduce the amount of inflation inputed into the final project cost. In the case of the new arena project, construction management could shorten the schedule by fifteen months over the conventional lump sum bidding/ general contractor approach.

Summary of Total Project Cost (1984 dollars)

The total project cost in 1984 dollars as itemized above is $116,203,000 using the Construction Management approach. This figure includes:

o Acquisitions	$23,000,000
o Arena Construction	78,915,000
o Garden Demolition	2,200,000
o Design Fees	4,120,000
o Construction Management Fee	3,530,000
o Project Contingency	4,438,000
TOTAL PROJECT COST	$116,203,000

Effects of Inflation

The rate of inflation has moderated during the last several years, and the Study Team believes that it is reasonable to assume a 5 1/2% annual compounded inflation rate over the life of the construction project. In establishing an annual inflation rate of 5 1/2% to the completion of the arena project, the Study Team has relied on its own experience and consulted with various outside experts. Among these are Chase Manhattan's Chase Econometrics, McGraw Hill (ENR), Dodge Reports, and Robert Means, publishers of historical cost indices. These organizations are not prone to predicting future indices. The historical cost index shows inflation on construction in Boston as follows:

Year	Percentage of Construction Inflation
1981 - 1982	13 1/2%
1982 - 1983	9.3%
1983 - 1984	4.8%

The average inflation rate for these three years is 9.2% and for the past two years is 7.0%. As shown above, the concerted efforts by government to curb and reduce inflation have been successful and indicate a trend toward stabilization. Therefore, the Study Team believes that it would be reasonable to carry a 5.5% inflation rate over the next few years.

Applying the estimated rates of inflated construction draw-down as indicated in Exhibit 11-3, the Estimated Total Inflated Project Cost would be $141,626,000 under the shortened construction schedule that could result from the use of the construction management approach. It should be noted that this figure does not include any proceeds from MBTA participation in land acquisition or proceeds from the sale of the development parcel between the Galleria and Causeway Street.

CONSTRUCTION STRATEGIES AND SCHEDULE

12

CONSTRUCTION STRATEGIES AND SCHEDULE

12

Summary of Work Performed

As the design concept for a new arena was developed during Phase II, Study Team members inventoried the constraints on and possible strategies for construction of a new arena at North Station. This information was used both for refinement of the design concept and for the creation of a construction schedule. Additional work concerning construction strategies and scheduling focused on analysis of the rate of construction drawdowns. Numerous iterations of the schedule were developed in order to identify the optimum solution.

Complexity and Assumptions

The complexity of the site, with its overlapping of projects and multiplicity of uses, places many constraints on the phasing of construction of a new arena. The following description of the sequence of the construction phases is accompanied by a diagram of the construction schedule and a set of illustrative sketches. The sequence described is for the most complex case and assumes Green Line relocation, extension of commuter rail tracks, and depression of the Central Artery.

Objectives

As the conceptual design for a possible new arena was developed, following selection of the North Station site for detailed analysis, various construction implementation objectives and issues were identified. These objectives are summarized as follows:

- Construction of the new arena should be done in such a way that allows the Boston Garden to remain in continuous and full operation with minimum inconvenience to spectators, MBTA riders and GSA building office workers.
- Construction of the new arena should be arranged so as to minimize, to the greatest extent posssible, any delaying effect on the implementation of the MBTA's North Station Transportation Improvements Project and the Central Artery project.
- Given the complex interactions and relationships between the arena construction and that of the MBTA, implementation mechanisms should be employed to optimize coordination between the two projects.
- The new arena construction period should be reduced as much as is reasonably possible in order to achieve the earliest possible opening date and to minimize the effects of cost escalation.
- The management of the process of construction should be structured in a way to maximize quality and minimize problems related to workmanship, schedule, and cost.

Phasing Strategy

Considering the above objectives, the Study Team developed an approach to new arena construction based on the premise that the work is divided into four distinct phases. It is important to note that the construction sequencing and the influence these procedures may have on cost must be and have been reflected in the construction cost estimate described in the previous chapter.

Phase I (Figures 12-1 and 12-2): The first portion of the project would consist of a joint MBTA/MCCA construction contract for all subsurface work and the arena floor structure. This approach would be the outgrowth of a fully collaborative design effort between consultants to the two Authorities for site preparation, sub-surface foundations, utilities, temporary and permanent shoring, etc. While requiring analysis and negotiation to achieve the fair allocation of capital between the respective Authorities, this coordinated approach to construction is necessary to ensure that the two projects are technically and spatially compatible. In addition to including the work necessary to build the arena up to and including the ice floor level, this construction phase would include all MBTA heavy civil construction such as Green Line tunnel and commuter rail subgrade construction. The completed arena ice level slab would serve as the construction platform for the remaining arena construction. The MBTA would have the option of proceeding with the Green Line tunnel under the existing Boston Garden during this phase, or waiting until the completion of Phase III when the Garden is demolished.

Construction staging issues would include the following:

- Adjacent construction staging area(s) would be needed and might include the parcel north of the GSA building.

- Continuous and safe access would be required to a temporary commuter rail station north of the ramps either by Lomasney Way and Nashua Street and/or through the site.

- Emergency egress from the Garden would have to be maintained along its north side.

- The service ramp constructed along Accolon Way up to the arena floor level would be temporary or permanent, depending upon plans for the Central Artery.

- Close coordination with MBTA and DPW work in the area will be required.

Phase II (Figure 12-3): Following completion of the subsurface and arena ice level construction, the balance of arena construction necessary to begin operations will take place. Considering the restricted site, the "ice level slab" aids in providing a means to deal with the many difficult construction and staging problems. This slab provides a working platform on which the arena's large span roof structures (which are not transportable to the site pre-assembled) can be erected. It provides an element allowing further construction work to proceed both above and below. Below, the completion of the Green Line can proceed along with platforms and trackwork of the commuter rail extension. Above, the assembly of arena seating and the placing of its supporting wall elements along with the installation of temporary roof truss supports can proceed almost unobstructed. This phase will essentially complete the arena project exclusive of the Galleria's arena-related elements which will eventually include escalators, graphics and lobby ticket windows. Construction staging issues would include:

- Constuction activities would be organized and scheduled to allow for the continuous operation of the Boston Garden.
- The utilization of existing pedestrian connections to the temporary commuter rail station would continue until the new station is complete.
- Until the Garden is demolished and the Galleria is built in the subsequent Phase IV, a temporary wall would be in place along the southern face of the arena.

Phase III (Figure 12-4): This phase would consist of the demolition of the Boston Garden structure following the opening of the new arena facility. Demolition would take place in a manner that would not inhibit the successful operation of the new arena, and special provisions would be made for pedestrian circulation in the area. Demolition priority would be given to the east end of the site in order to allow the new Green Line/Orange Line subway station to be completed as soon as possible.

Phase IV (Figure 12-5): The final phase of public sector arena-related construction at North Station would consist of the completion of the Galleria, which would be a joint MCCA-MBTA project. The arena's four escalators, connecting the train concourse level and the arena ice level, and a small amount of ice-level horizontal circulation space would be erected during this phase. Concurrently, the MBTA would complete the entire commuter rail and Orange Line/Green Line stations.

Additional Private Sector Development

Phase V (Figure 12-6): The development of retail and office space between the Galleria and Causeway Street could begin simultaneously with the construction of the Galleria, or anytime following its completion. Obviously, it would be desirable to complete the development of this parcel as soon as possible so that spectators and public transit passengers could circulate on the site without disruption through the completed Atrium. The two-building plan has the advantage of allowing for a two-phased development: the western side of the site may be ready for private development earlier since it is not constrained by the construction of the Green Line/Orange Line station as is the east side. This phase would be a private development project which conformed to lease or sale covenants and review by the MCCA. In addition, the private developement would have to conform to site development guidelines set by the MBTA and the BRA. A public pedestrian easement would be required for the Atrium. Ground floor space adjacent to the Galleria would be reserved for the Green Line Station at the east end and the arena ticketing office at the west end. Final site landscaping and streetscaping would be completed during this phase.

Construction Management

The realization of a new multi-purpose arena will require a skilled management effort of major proportions, particularly because of the constrained site and complexity of coordination with the MBTA, DPW and private sector construction. The Study Team recommends that implementation of this project would best be served by utilizing the services of a Construction Manager in lieu of the conventional general contractor. To realize the full benefits of this approach, it is recommended that the Construction Manager be selected for work on the project at the same time as the final design team is selected, that is, as soon as possible following project approval. The method of selecting the Construction Manager should be as rigorous as those procedures used to select the final designer.

The most significant time and cost savings resulting from the Construction Management approach are realized by the overlapping of the design and construction phases. Work can proceed with foundations and completion of the ice level slab before finalization of arena drawings. Additionally, Construction Manage-

FIGURE 12-1
PHASE IA : SUB - SURFACE CONSTRUCTION

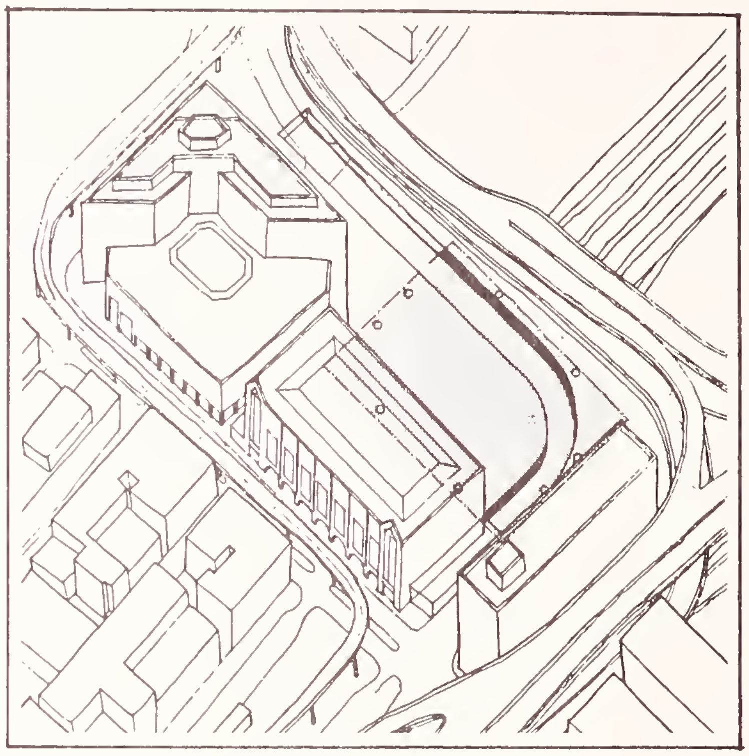


FIGURE 12-2
PHASE IB : ARENA FLOOR

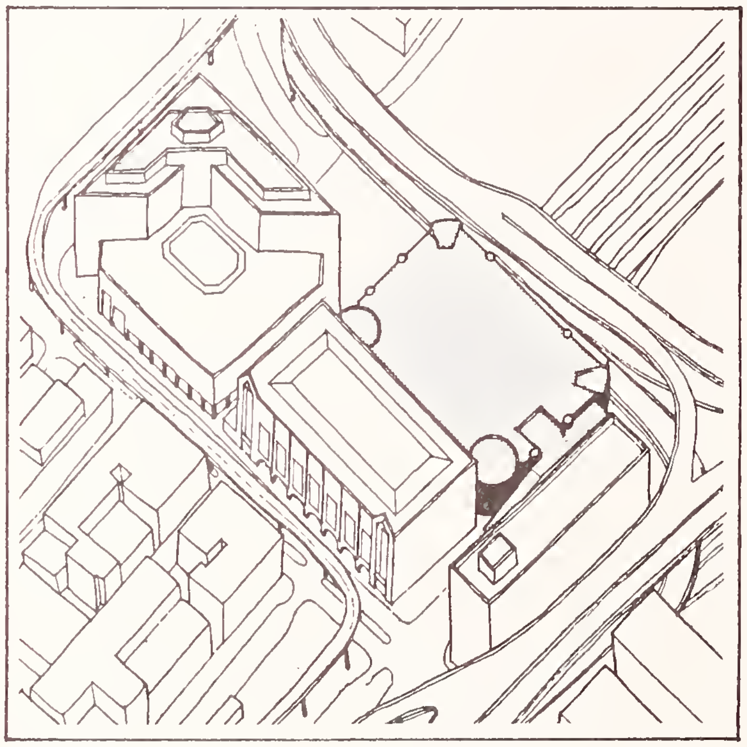


FIGURE 12-3
PHASE II : ARENA COMPLETION

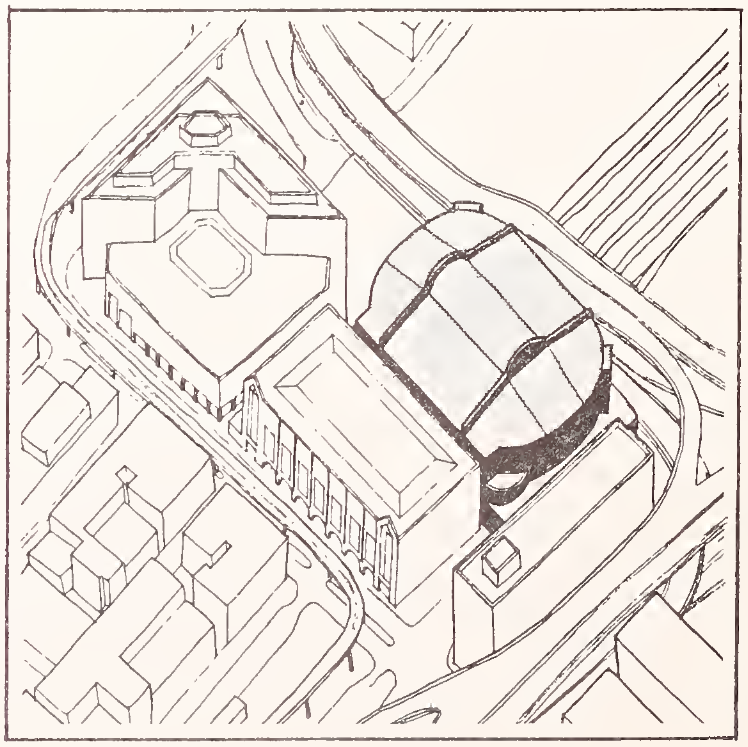


FIGURE 12-4

PHASE III : BOSTON GARDEN DEMOLITION

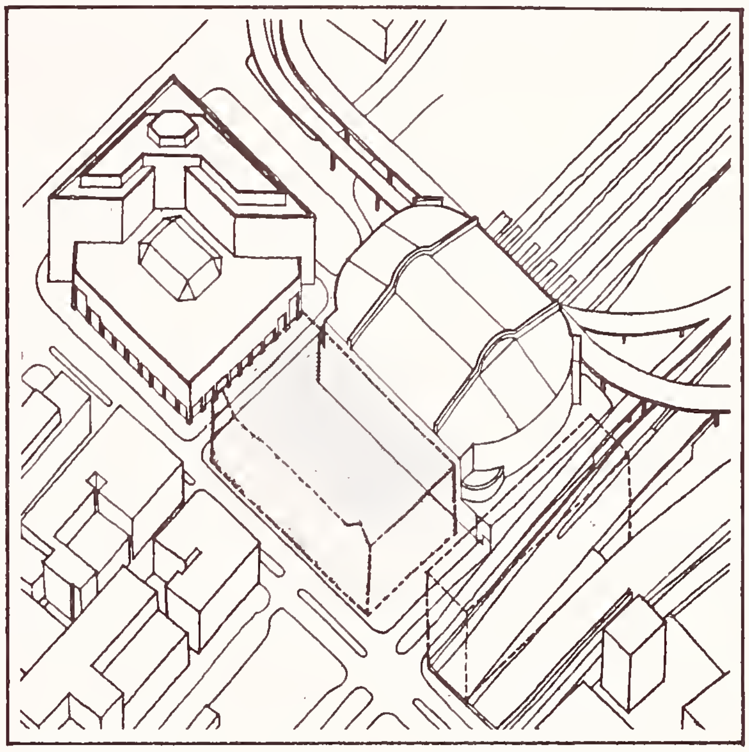


FIGURE 12-5

PHASE IV : GALLERIA CONSTRUCTION

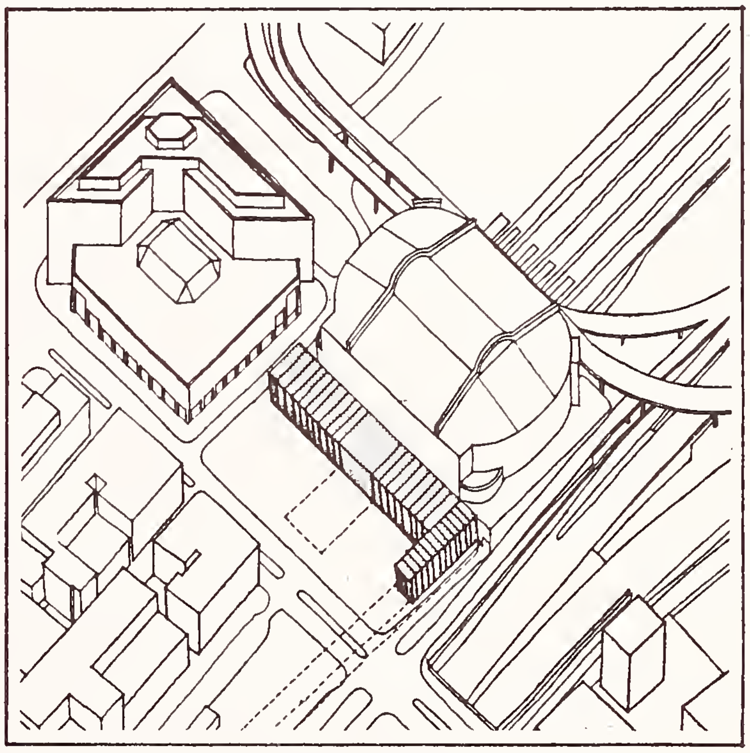
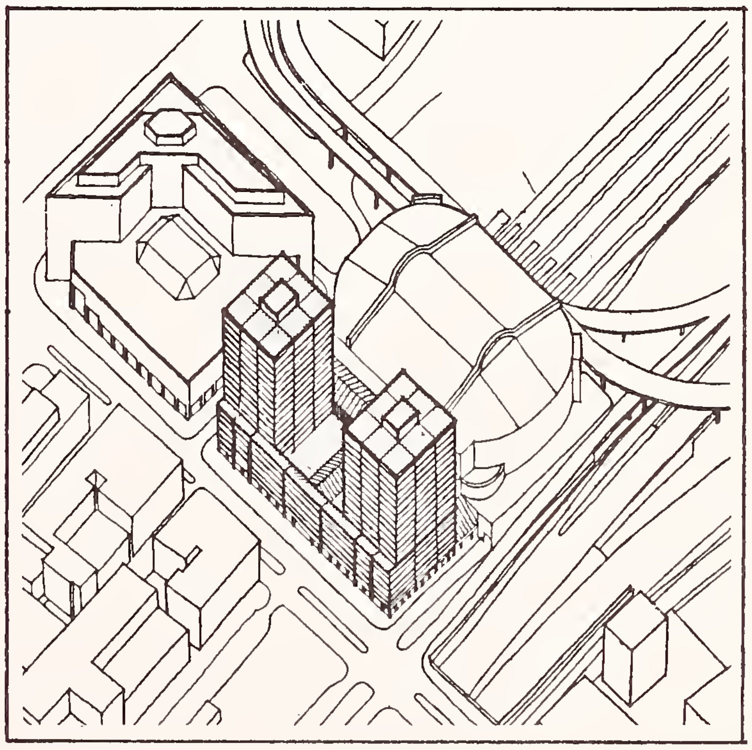


FIGURE 12-6

PHASE V : PRIVATE DEVELOPMENT SITE



ment allows the possibility of simultaneously completing rail work below and the air-rights arena construction. With the management of the project in capable and experienced hands, a greater efficiency will result in the coordination of construction activities with other agencies and/or contractors, minimizing the effects of delays. Benefits will also accrue by having the input and reactions of practical construction-oriented people to the design as developed, thereby allowing the incorporation of features which will facilitate cost-effective execution in the field.

Significant financial savings can be realized by the Construction Manager's response and the resulting influence on design by full consideration of construction practicalities. Furthermore, the skillful scheduling and "packaging" of smaller contracts permits more widespread competition and less necessity for long-term predictions of escalation and labor agreements affecting ultimate cost of the work.

Various sensitivity analyses were performed to evaluate the effect of Construction Management on overall project completion dates and costs; the effect is dramatic. Specifically, it is estimated that utilization of the Construction Management approach for the construction of a new arena could result in 12% lower cost and an overall time savings of almost two years compared to conventional construction. Because of these advantages and because of the project's complex relationship to other construction activities, the Construction Management approach is a necessary feature of project implementation.

The advantages of Construction Management are summarized below:

1) Provides earlier construction start-up completion of project
2) Lowers cost of construction
3) Lowers cost of financing
4) Provides earlier return on investment
5) Superior final design of project
6) Facilitates coordination with MBTA and DPW projects
7) Establishes earlier credibility for the project
8) Allows owner additional time and flexibility in the decision-making process

9) Permits all construction work to be carried out on the basis of public, competively bid, bonded, lump sum contracts.
10) Provides a greater control of the construction process which will minimize the negative impact on the Garden and commuter rail operations.

CONSTRUCTION SCHEDULE

The construction schedule illustrated in Figure 12-7 indicates the four major phases of the arena construction as described above. Specific detail of the arena construction schedule is shown in Exhibit 12-1. Key features of the schedule, which indicates a new arena opening in late spring, 1989, are described below:

Project Start-up: September 1, 1985

This start-up date represents the simultaneous beginning of design, the Environmental Review process, and involvement of the Construction Manager. It is important to note that if it is decided to proceed with the project, this start-up date is contingent upon legislative and executive decisions, approval of funding, and consultant selection. In addition, it is necessary that the project and funding approval of the MBTA's North Station project take place prior to this date since the new arena at North Station is not feasible unless the relocated Green Line is depressed under the site. It is essential that the MBTA's design consultants work simultaneously with the arena's design team.

Sub-Surface Construction Start-up: July 1, 1986

The first phase of construction, the sub-surface and arena floor work, would begin approximately ten months after the beginning of the design process. The partial overlap of construction and design is possible through the use of the Construction Management approach.

Air-Rights Arena Construction Start-up: July 1, 1987

This major phase can begin approximately two months before completion of the Phase I work. With twenty-three months of construction allowed for this phase, this a critical start date so that the arena can open in the late Spring of 1989.

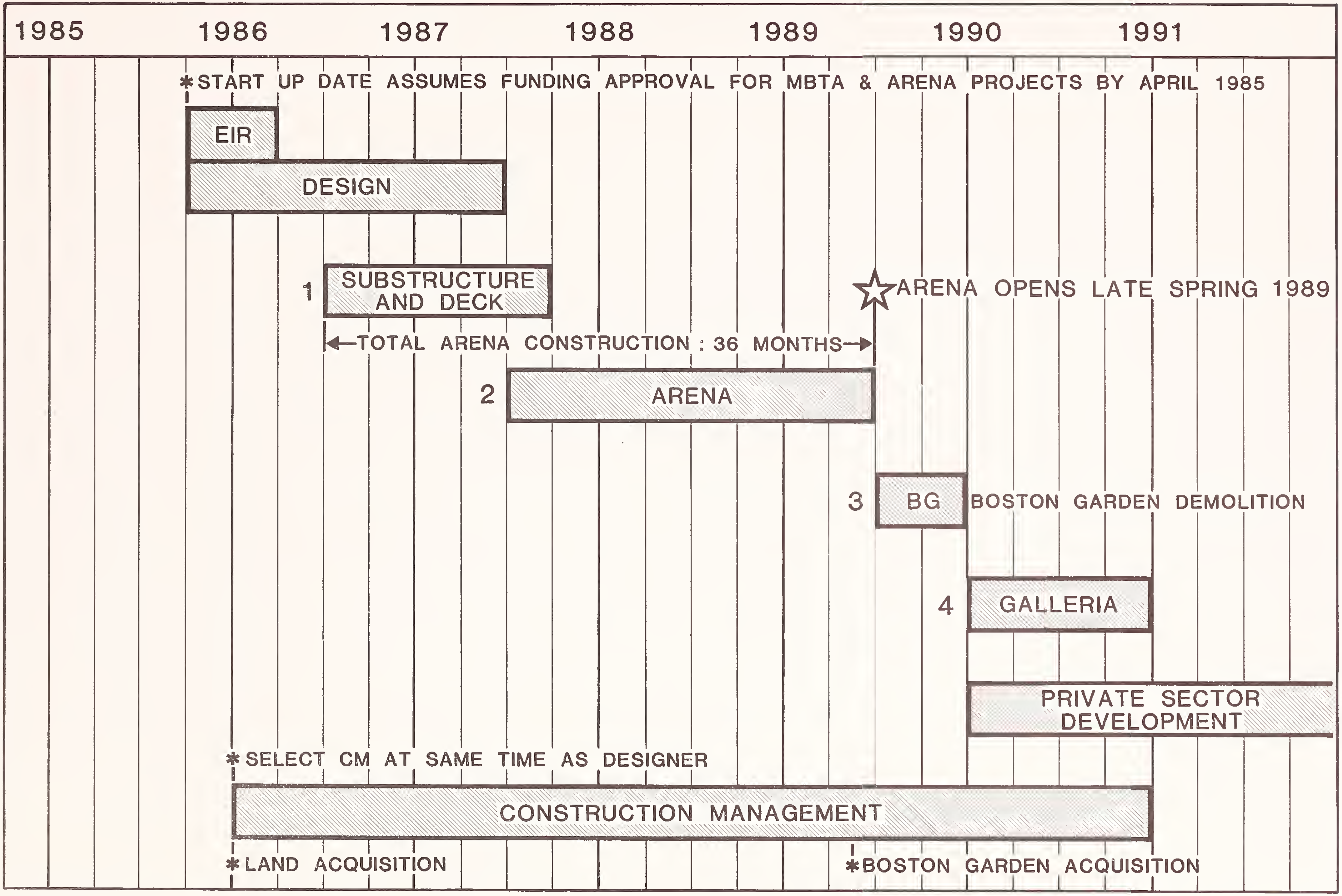
Arena Completion: Late Spring, 1989

This is the ideal time of year for the new arena to begin operations since the event schedule during the summer will not be as intense as at other times of the year.

Boston Garden Demolition: July-December, 1989	As soon as the new arena is operational, the Boston Garden would be demolished to make room for the Galleria and private sector development along Causeway Street.
Galleria Construction Start-up: January, 1991	It is anticipated that the final construction will be of approximately one year's duration, with construction of the Galleria beginning as soon as the site has been cleared. During this period, the MBTA would complete its construction of the new Green Line/Orange Line station as well as all of the train station components of the Galleria.
Start of Private Sector Development: January 1990	Ideally, a developer for the Causeway Street parcel will have been chosen early during the arena project to allow for the full design coordination between the Galleria and the private development on its southern edge. This phase would include the construction of the Atrium. The Galleria and private sector construction could occur simultaneously.
Completion of Entire North Station Project:	Allowing approximately two years for the completion of the private sector development, the entire North Station project in its final form would be completed by the end of 1991. Completion of the ground floors, including the Atrium and retail components, could be open to the public before the completion of the upper floors of the office buildings.

FIGURE 12-7

CONSTRUCTION SCHEDULE FOR A NEW ARENA



ALTERNATIVE FINANCING STRATEGIES

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ALTERNATIVE FINANCING STRATEGIES

13

INTRODUCTION

The purposes of this chapter are to:

- describe all public and private sources of arena financing that were considered by the Study Team;
- describe the criteria that were used in determining those methods that could be viable options for an arena financing strategy; and,
- present the impact of alternative financing strategies on the financing costs to be paid by the Commonwealth and, ultimately, the State taxpayers.

Essentially, the results of the financing strategy analyses quantify the range of State taxpayer support, if any, necessary to fund a new arena under a number of viable financing options.

Throughout this Chapter, certain terminology will be used when referring to categories of financing options. Definitions for these terms are as follows:

- Viable means using a conservative approach to inclusion of revenue and/or capital financing options to fund the construction or operation of the new arena. "Viable" options exclude most non-traditional or non-assured financing sources in order to estimate the amount of public debt which might be required under the various scenarios.

- Public refers to financing sources which originate with taxpayers in general or are supported by supplemental revenue sources that could be levied by the Commonwealth. This can also refer to financing sources originating from Federal grant or loan subsidy programs.

- Private refers to non-state supported financing sources and non-Federal grant or loan subsidy programs. It refers to sources of financing originating primarily from the private sector, especially arena users, patrons, major arena tenants, and the local business community.

CRITERIA USED FOR SELECTING VIABLE FINANCING OPTIONS

The criteria used for evaluating the financing options were as follows:

1) The viability of financing options does not rely on liberal interpretations of current Federal tax regulations.

2) The financing option could represent a significant source of funds and have a major impact on reducing the taxpayer-supported indebtedness.

3) Implementation of the financing option could be accomplished by the NCCA upon legislative approval.

4) The timeframe for implementation could yield financing commitments prior to the third quarter of 1985, the assumed start date for new arena design activity.

5) Precedents exist elsewhere in the industry for use of the financing option in funding arena projects.

6) The financing option represents a fair economic tradeoff between three issues: (1) retaining control of arena policy and operations, (2) maximizing ongoing arena revenue sources as supplements for debt service, and (3) the amount of initial

contributions to the arena's construction costs.

7) The financing option has a clearly identifiable market; that is, the source for the financing is a fairly narrow and definable subset of the arena's patrons, major users, the general business community, or other beneficiaries from arena operations.

FINANCING METHODS CONSIDERED

PUBLIC FINANCING SOURCES

The sources of public financing considered for construction of a new arena can be grouped into the following four classifications:

- General Obligation Bonds
- Revenue Bonds
- Dedicated Tax Revenues
- Federally Sponsored Grants

General Obligation Bonds

General obligation bonds may be issued by the Commonwealth of Massachusetts. General obligation bonds pledge payment of interest and repayment of principal from the State's General Fund. The source of revenues to support debt service payments are not specifically identified or dedicated. While the State may, from time to time, enact or identify tax sources as revenues to the General Fund, specific revenue sources are not, in general, earmarked for debt service payments on any particular general obligation bond issue.

Revenue Bonds

Revenue bonds issued by the MCCA represent another public financing alternative. Debt service on revenue bonds specifically linked to the construction of the arena would first be paid from the net operating revenue of the facility. Should the net operating revenue of the arena be insufficient to pay debt service, other funding sources can be specified in the bond covenants to make the payments. These funding sources can include any and all revenues of the MCCA, or, as a last resort, the General Fund of the State (State guarantee) or specified, dedicated tax revenues. Revenue bonds often provide an escrowed deposit of one year's principal and interest (the debt service reserve fund, or DSRF) as additional debt security. Also, revenue bonds associated with a specific revenue-generating project often require additional borrowing to cover the capitalization of interest payments to bondholders up to the point when the project itself is operational and generating revenues to support debt service.

Revenue bonds could have a somewhat higher interest rate compared to general obligation bonds issued by the Commonwealth. This would be the case, for example, if the revenue sources available for debt service on the revenue bonds were perceived to be less secure than the General Fund revenues. The potentially higher interest rate and DSRF requirements, in conjunction with potential additional borrowings for interest capitalized over the arena's construction period, result in a significantly larger bond size for revenue bonds, as compared to general obligation bonds. This is illustrated in Exhibit 13-1, where a general obligation bonding approach could yield a bond size that is 52 percent lower than a comparable revenue bond for the same construction program. The bonding requirements shown in Exhibit 13-1 and elsewhere in this report were developed with the assistance of Kidder, Peabody & Co., Inc., and were based upon arena construction project cost and timing assumptions provided by the Study Team.

Tax Revenue Sources

In practice, characteristics of both revenue bonds and general obligation bonds are often combined when the actual financing mechanism is being designed for a particular construction project. For example, the potentially higher interest rates and borrowing requirements for revenue bonds may be reduced by dedicating additional revenue sources or secondary general obligation backing to the debt service payments on the revenue bonds. This combined approach is most applicable to agencies which have access to revenue sources over and above those generated by the construction projects which require the debt financing.

The tax revenue sources considered as potential financing alternatives for the new arena include General Sales taxes, and Food and Beverage taxes and Hotel/Motel Room Occupancy taxes.

Exhibits 13-2, 13-3 and 13-4 present comparative General Sales, Food and Beverage, and Hotel/Motel Room Occupancy tax rates for major cities in the U.S. These exhibits also show the use of these tax revenues.

Exhibit 13-2 shows General Sales tax rates ranging from 4% to 12%, with an average rate of approximately 6-1/4%. Massachusetts compares favorably with a 5% rate. Exhibit 13-3 shows General Sales tax rates if applied to food and/or beverage purchases, as well as specific Food and/or Beverage taxes. Taxes applied to food and beverages range from 4% to 12%, with an average rate of approximately 6-1/2%. Massachusetts' tax rate is again slightly lower than the average.

Exhibit 13-4 shows Hotel/Motel Room Occupancy tax rates and also indicates whether the General Sales tax is applied to gross room revenues as well. As shown, the total of all taxes applied to gross room revenues ranges from 5% to 16-1/2%, with an average of approximately 10-1/2%. Massachusetts' Hotel/Motel Room Occupancy tax rate of 5.7% is significantly below the average total room tax rate for the surveyed locations.

States and municipalities frequently set Hotel/Motel Room Occupancy tax rates higher than General Sales and Food and Beverage tax rates because a high proportion of the Hotel/Motel Room Occupancy taxes are often generated from out-of-state visitors. Moreover, as shown in Exhibit 13-4, both Indianapolis and New Orleans (as well as Minneapolis which is not shown) have dedicated Hotel/Motel Room Occupancy taxes to finance sports facilities.

Between 75 and 85 percent of statewide hotel and motel room revenues in 1983 were generated by out-of-state visitors, according to information contained in Massachusetts Travel Series. This publication is a quarterly survey of statewide tourism-related statistics and issues, published under the guidance of Professor Norman G. Cournoyer of the University of Massachusetts at Amherst. The out-of-state proportion for Massachusetts is expected to increase further, given the proposed expansion of the Hynes Convention Center in Boston and the MCCA's efforts to strengthen the State's national marketing program for major conventions and expositions.

Given the generally lower tax rates relative to comparable cities, and the non-resident nature of the tax burden, the Hotel/Motel Room Occupancy tax is a preferable dedicated tax revenue source over the General Sales and Food and Beverage taxes.

Exhibit 13-5 presents historical Hotel/Motel Room Occupancy tax revenues in the State. These tax revenues have grown at an average annual compounded rate of 12% between 1973 and 1984.

Exhibit 13-6 presents estimated annual Hotel/ Motel Room Occupancy tax revenues through 1994, using a range of hypothetical tax rates. The exhibit shows annual statewide Hotel/Motel tax revenue estimates, at the current tax rate of 5.7%, as well as revenue estimates for three other tax rates, up to a 10.0% rate. The 10.0% rate is approximately equal to the average of the total, State and city room tax rates of the 22 locations surveyed by the Study Team.

Hypothetically, the use of tax revenues as a dedicated source of construction financing can be applied three ways:

1) To pay construction costs directly.

2) As a source of funds earmarked for debt service payments on specific bonds issues associated with financings for specific construction projects.

3) As a general source of funds to the revenue-receiving agency, like the MCCA, which would issue revenue bonds for construction financing. In this case, the tax revenues can be dedicated to any and all agency expenses, including debt service on construction financing.

Exhibit 13-7 presents one scenario for direct funding of the construction program through Hotel/Motel Tax dedication. In the calculations shown in Exhibit 13-7, 75% of a hypothetical increase in the tax rate from 5.7% to 9.0 % is assumed to be available to pay arena construction costs directly. As shown in the Exhibit, this leads to a maximum, temporary, short-term borrowing requirement of $80,872,000, occurring during 1989. This short term borrowing arises due to the shortfall of dedicated Hotel/Motel tax receipts compared to periodic construction cost payments, net of interest earnings. Exhibit 13-7 also shows that the full costs of arena construction would be fully paid by the end of 1994.

Exhibit 13-8 presents another scenario for use of Hotel/Motel tax receipts to finance arena construction. In this scenario, 75% of a hypothetical increase in the tax rate from 5.7% to 9.0% is assumed to be available to pay debt service on State general obligation-type debt issued at the beginning of the construction program. Exhibit 13-8 shows that through this mechanism, there would always be sufficient

Hotel/Motel tax receipts to cover the $13.2 million on-going debt service for the arena-related bond issue.

Federally Sponsored Grants

Four types of Federally sponsored grants were considered as potential financing sources. These were:

- Urban Development Action Grant (UDAG)
- Economic Development Authority (EDA) Grant
- Community Development Block Grant (CDBG)
- Urban Mass Transportation Administration (UMTA) Funding

The parameters of the arena construction project were compared to the objectives, type of assistance, use restrictions, and general eligibility requirements of each grant program, as well as the current level of funding of these programs.

The Study Team's conclusion is that relatively small amounts of UDAG, EDA and CDBG grant monies may be available for the arena project, and any significant Federal participation from these sources is considered unlikely. Therefore, these grant funds were not considered as viable options for the arena financing strategy.

UMTA's willingness to fund part of the arena construction costs, an air-rights structure over a transit station is uncertain. It is likely that the MCCA and MBTA would have to coordinate the excavation of the site for the transit station and build the supports for the arena under a joint construction contract in order for the costs to be potentially eligible for UMTA funding. However, UMTA funding for air-rights arena construction premiums was not included in the preliminary financing plans, because current Federal policy concerning use of UMTA funds in joint development projects has not been clarified.

Compared to air-rights cost-sharing, joint participation by the MBTA in the purchase of the land behind the Garden may be a more reasonable prospect. Based upon the MBTA's proportion of land area occupancy, the study team believes that MBTA sharing of $3,300,000 out of the total estimated land acquisition cost of $8,000,000 is a viable option to consider in the arena's financing strategy.

PRIVATE FINANCING SOURCES

Summary of Sources Considered

The sources considered for private financing of arena construction costs and/or for on-going supplements to operating revenue were as follows:

1) Contributions to the facility's equipment and outfitting costs from private sources.
2) Sale or lease of the development parcel fronting on Causeway Street.
3) Sale or lease of the arena name.
4) Charitable contributions or proceeds from a fund drive.
5) Sale or lease of suites on the arena concourse level.
6) Sale or lease of skybox suites which could be added above the balcony level.
7) A surcharge on all patron ticket sales.
8) Various types of lottery programs (for example, to name the new arena or to win season tickets).
9) Sale of seat preference bonds.
10) Capital contributions from major tenants or users of the arena.
11) Sale of "civic bonds" (junior lien tax-exempt debt instruments, carrying an interest rate below the market rate on the arena's primary, State-backed debt issue).
12) Extensive co-promotion of events, to enhance the arena's net revenue.

In many cases, the options listed above offer tradeoffs between funds received up front to reduce the construction cost and options for continuing, supplemental revenue sources to support debt service. For example, if the MCCA were to "sell" the arena name to the highest bidder, then a portion of the arena's ongoing advertising revenue might be foregone. Another example would be the potential "sale" of concourse suites which would eliminate a significant amount of annual suite rental income. Exhibit 13-9 summarizes the instances where tradeoffs would be made between initial capital contributions and annual revenue sources for each of the private financing options.

Contributions to the Facility's Equipment and Outfitting Costs

Contribution to the facility's equipment and outfitting costs or actual donation of selected equipment items is a common practice in the industry. This is particularly true when the donor is a user group which will clearly benefit from the use of the contributed equipment or the related advertising and publicity benefits.

The types of equipment which are candidates for outside contribution or donation fall basically into two categories. The first is equipment which clearly relates to and benefits a specific arena user or tenant. Examples of this type of equipment are:

- concession equipment
- finishes and furnishings for suites
- home team locker room facilities
- equipment and furnishings for the in-house restaurant or club
- the central scoreboard

The second category of potential contributed equipment is less directly related to specific arena user groups but may still represent some potential interest to general interest groups. Examples of this second type of equipment are:

- a movable stage
- stacking chairs and tables
- pedestrian control devices (such as turnstiles and ticket stub boxes)
- house lighting and/or sound system equipment

Based upon equipment cost estimates compiled during the project cost estimating task, the Study Team believes that $2,800,000 of the first, user-specific category of equipment might be available for contribution to an arena construction program (in 1984 dollars). This amount is a viable option for inclusion in the arena financing strategy.

The Study Team believes that few viable opportunities exist for outside contributions to the costs of the second, more general type of non-user-related equipment as described above. This is because the nature of the contributed equipment is more related to overall, in-house arena operations and less related to the interests of any specific group of contributing arena users.

Sale or Lease of the Land Underlying the Boston Garden

Sale or lease of the land underlying the Boston Garden represents a major investment tradeoff decision. As previously discussed, this land must at least temporarily come under public ownership, since a portion of this parcel is required to complete the Galleria phase of arena construction. Once the Garden is razed and the Galleria complete, a very valuable land parcel would be available for further development by the private sector.

The Study Team estimates that if the State were to retain ownership of the parcel, the 1984 dollar-value of the land lease to private developers would approximate $1,200,000 annually. There is a considerable upside appreciation potential to this lease value which could well exceed the general rate of inflation. Under State ownership, the land lease proceeds could help offset the State's debt service costs on the arena. If, on the other hand, the State were to sell the land, cleared and ready for development, a conservative estimate for the land value might approximate $11,000,000 in 1984 dollars.

It is difficult to say definitively at this time, based solely on economics, whether the State's policy should be to retain ownership of the development parcel or sell it once Galleria construction is under way. For example, the present value of 30 annual lease payments of $1,200,000 at the State's assumed cost of borrowing of 10.5% is approximately $10,900,000, or nearly equal to the parcel's conservatively estimated sale price in current dollars. If appreciation occurred in the value of lease payments over the 30-year period, then the present value of the lease payments would be greater than $10,900,000. Since appreciation is likely to occur in both the value of lease payments and the parcel's selling price, an economically conservative approach would be to assume continued State ownership of the land until such time as market forces provided better indications of land lease versus sale values. Then, during implementation of the arena program, more definitive analyses could be performed to determine the actual economics of ownership.

For purposes of estimating the new arena's cash flow available for debt service, the Study Team has assumed continued ownership of the front development parcel and, therefore, receipt by the arena's owner of $1,200,000 (in 1984 dollars) in annual land lease payments.

Sale or Lease of the Arena Name

There are few precedents for outright, up-front sale of the advertising benefits associated with the name of a publicly-owned arena in a major national market such as Boston. Therefore, valuation of the new Boston arena's name is highly speculative and made even more difficult by the dependencies on the exact structure of the contractual ownership rights which might be sought by prospective purchasers.

Many specifics of the sale agreement would have to be delineated prior to a precise determination of the value of the arena's name, such as:

- duration of the contract
- public policy which might influence the type of national advertiser sought
- the nature of rights afforded to the purchasing advertiser, such as the amount of internal signage, provision of special seating and ticket privileges, participation in concession supply contracts, and others
- the expected level of media exposure, locally, regionally, and nationally, that the arena might provide
- the structure of other ownership rights offered to the purchaser to allow for the tax deductibility of the purchase or lease costs as an expense in the purchaser's normal course of business

In addition to the contractual specifics, the State should evaluate this financing option in terms of the tradeoffs imposed, some of which are:

- the degree to which the sale of a publicly-owned facility's name would be allowed under existing Massachusetts statutes and desirable under current public policy
- the amount of future advertising income which might be foregone compared to the potential value of the long-term lease or one-time sale
- the degree to which State control over internal arena advertising policy and operations might be affected

Discussions with arena operators indicated that an outright sale of the name of a publicly-owned arena located in a major market is probably economically unsound, since the value of foregone future advertising rights could not be accurately estimated. These same discussions identified potential public policy and statutory issues that would have to be resolved if even a long-term lease of the arena name were to be considered. For these reasons, the Study Team determined that this financing option should not be included in the financing plan at this time.

Charitable Contributions or Fund Drive Proceeds

Charitable contributions or fund drive proceeds from the local community have been successful in a limited number of arena financings elsewhere. For publicly-owned arenas, this approach is often most successful in smaller markets which might lack a large, existing patron base to assure arena utilization. Another factor would be the lack of existing professional sports tenants in the smaller markets. For example, the Worcester Centrum lacked a major sports tenant and therefore was partially financed by gifts of approximately $3,000,000 from the local business community which had a vested interest in seeing the facility succeed as a catalyst for downtown revitalization.

The Study Team does not believe that an organized program to solicit charitable contributions to the capital cost of a new arena in Boston will yield significant proceeds in relation to the total project cost, for the following reasons:

- despite the civic benefits of the facility, often the beneficiaries of the new arena are perceived to be a small portion of the general populace, namely, the sports fans, the concert-goers, and the sports teams
- interviews with local business leaders indicated little support for the fund drive concept, unless contributors received commensurate rights and privileges to use the facility
- no logical sponsor of the fund drive presently exists

Therefore, this financing option is not considered to be a viable financing alternative.

Lease Proceeds from Concourse Suites

Lease proceeds from suites are a major source of income for many arenas. There are numerous examples of older arenas planning for the addition of suites when undertaking a renovation program (as occurred in Hartford and Montreal). Most of the arenas in the Study Team's industry survey had some form of suites, including almost all of the arenas visited during the on-site interviews.

The number of suites, their location within the arena, the average seating size, and the rental prices (whether with or without event tickets) varied widely within the facilities surveyed by the Study Team. Exhibit 13-10 summarizes the industry survey responses to questions concerning suites. The results for the Boston Garden are included as well. No respondents indicated that ownership rights to suites were ever sold to patron groups.

Since suite rental is a highly conventional revenue source for arenas, the baseline revenue and expense projections developed in Chapter 10 of this report for a new arena in Boston already include this income source. The Study Team's proposed design concept for the new Boston arena includes 27 concourse-level suites, seating an average of 16 patrons each. A conservative current-dollar estimate for the average market rental would be $40,000 per year per suite. Charges for event tickets and concessions would be in addition to suite rental prices. This yields, for 27 suites, $1,080,000 in estimated annual suite rental income, in 1984 dollars.

As part of the detailed design of the financing plan, the MCCA should investigate the applicability and limitations, if any, imposed by the IRS Code, Section 103.B.18 with respect to construction financing of the concourse suites. The regulation places limits on the usage of tax-exempt industrial development bond financing for projects which include skyboxes or other private, luxury boxes, where the facility's principal users are taxable entities. The manner in which this regulation applies to State-owned facilities, financed through publicly-issued debt, should be analyzed and considered in the detailed design of the financing plan.

"Skybox" Suites, Above The Balcony Level

"Skybox" suites above the balcony level could be added to the basic arena design concept presented in Chapter 7 of this report. Twenty-nine additional skyboxes, seating between 14 and 18 patrons each, could be accommodated through alterations to the upper structural and roof systems. The additional capital cost would be approximately $5,500,000 in 1984 dollars or approximately $6,700,000 in inflation-adjusted construction costs. Skybox finishing and furnishing costs would be in addition to these amounts.

At this time, the Study Team does not believe it is economically justified to incur these additional skybox capital costs, for the following reasons:

- In order to cover the incremental debt service on the additional capital investment, the annual rental income from each skybox would have to be at least $26,000, before payment of event ticket costs. This is quite a high price for skyboxes with inferior views and patron access, compared to the suites on the concourse level.
- The existence of the 29 skyboxes could potentially suppress market demand (and thus the market rental) for the 27 concourse level suites.
- Addition of the skyboxes severely compromises the arena's design, aesthetics, and operating cost efficiency. (For example, it would result in increases in utility and security expenses).
- Few precedents exist elsewhere in the industry for as many as 56 suites in total, based upon the survey results shown in Exhibit 13-10. This would be the case if the 29 skyboxes were added to the 27 concourse suites in the Boston arena design concept.

Based on the above, rental income (and the additional capital costs) associated with skyboxes have not been included as a viable option for the Boston arena financing strategy.

A Surcharge on Ticket Sales

A surcharge on ticket sales is an appealing and potentially viable source of supplemental income for a new arena, provided that the surcharge is small in relation to the basic ticket price. Support for this source of income includes:

- local precedents (Wang Center)
- the fact that the levy is directed at arena patrons - one of the key beneficiaries of the new facility; therefore, the surcharge is often perceived to be fair
- the administration of and accounting for the revenue source can be combined with the normal admissions and ticket sales functions within arena operations

- only a small surcharge is needed in relation to average ticket prices (projected to be approximately $12.60 for the new arena, in 1984 dollars) and therefore should have little impact on demand while producing a moderate amount of supplemental arena income

Based upon projected annual attendance of approximatey 2,800,000 patrons, a modest $1.00 ticket surcharge would yield around $2,800,000 (in 1984 dollars) of supplemental income to fund debt service or other non-operating costs of the arena. The Study Team believes that this amount can be assumed as a viable option in the arena financing strategy.

A key implementation issue is to assure that the ticket surcharge revenue is dedicated for use by arena operations or to support arena debt service, rather than being available as general State tax receipts.

Lottery Programs

Lottery programs have had limited consideration elsewhere (as in Toronto for a new stadium) as a source of equity contributions to the arena capital cost or as a supplement to arena operating income. However, little support for the concept was expressed during the local interviews, due to the following potential problems:

- The cost of administration could be quite high in relation to the proceeds. Perhaps 10 to 12 percent of proceeds would be needed for administrative costs, even for a successful lottery program.

- An arena lottery poses the risk of diluting the demand for the existing lottery programs in Massachusetts.

- There may be little general, statewide demand for an arena-related lottery, beyond the immediate Boston vicinity.

- An arena lottery runs counter to the original State lottery concept in Massachusetts; namely, to generate additional revenues for use by local city and town governments.

- It is not clear that an approval would be forthcoming from the State Lottery Commission to offer a Boston arena-related lottery.

For the reasons cited above, the Study team determined that a lottery program should not be considered as a viable option in the arena financing strategy.

Sale of Seat Preference Bonds

Sale of seat preference bonds has been used elsewhere (Dallas, for example) as a source of low-cost debt financing to supplement the main financing approach for new arenas. Discussions with knowledgeable parties indicated that the following conditions were necessary for this mechanism to work:

- The arena construction project should have wide community support and general public appeal. Support among the local business community was judged to be particularly important for seat preference bonds to be widely marketed.
- There should be no pre-existing season ticket holders to any events in the new arena for the seat preference bond option to be viable.
- Only a portion of the seating capacity of the new arena should be allocated through seat preference bonds. This allows for a large portion of the seats at any event to be available to the general public through normal ticket sales.
- Organizations such as underwriters, bond trustees, and seat rights administrators should be identified as willing to take on the substantial expenses of issuance, publicity, record-keeping, and on-going relations with holders of the seat rights. This latter task can be quite complicated, since each year the seat preference bond holders must be handled first, before season ticket holder demand can be fulfilled. Also, transfer of the seat preference rights as bonds are traded creates additional administrative complexities.
- The overall financing program for the arena must not be dependent on proceeds from seat preference bonds, since such proceeds could be small in relation to the total arena cost. Dallas received approximately $6,000,000 (out of a total 1980 project cost of approximately $30,000,000) in seat preference bond proceeds, with very wide community support for the new arena.

The resultant number of bonds that could be associated with unallocated seats in the new

Boston arena may be small (as low as 2,000 seats, the approximate increase in basketball capacity between the amount Boston Garden and the new arena). This is due to the large number of existing season ticket holders in Boston (12,800 for the Celtics and approximately 9,000 to 10,000 for the Bruins), and the teams' probable reluctance to support a seat preference bond program before current waiting lists for season tickets are accommodated.

The Study Team estimates that the absolute maximum number of seat preference bonds that could be made available is 4,500, based on the selling of all of the difference between the current number of basketball season ticket holders and the arena's new basketball seating capacity (17,300). Given the need to provide preference to existing season-ticket holders on seat selection, the residual 4,500 seats would be the lowest quality seats. Therefore, selling seat preference bonds for a small number of the least desirable seats in the new arena does not appear to be a viable financing option.

Solicitation of Capital Contributions from Major Tenants

Solicitation of capital contributions from major tenants (to pay for locker room, training room, medical, exercise, or playing surface equipment) must be carefully weighted against the strong potential for reciprocal discounts in the rent charged to the equipment donors. Since the value of equipment that might be funded by the major tenants is a small portion of the total cost of the project, and since reciprocal rent discounts to the teams are a strong possibility, the Study Team determined that this source of financing should not be considered as a viable option in the arena financing strategy.

Civic Bonds

Civic bonds is a generic term referring to tax exempt debt securities, typically in a collateral position secondary to the principal bondholders and which carry an interest rate slightly lower than the primary financing mechanism. The civic bonds may be marketed to local institutions as a demonstration of their financial support and commitment to the overall community and to the project itself.

From the bond issuer's perspective, use of civic bonds lowers the interest expense portion of the cash flow required to support debt service. Civic bonds do not represent any form of equity or reduction in the total bonding requirements.

Precedents are lacking in Massachusetts for issuance of civic bonds for major, public construction projects like a multi-purpose arena. Also, substantial legal and technical research may be needed to determine if such bonds are issuable in general and could be applied to funding for a specific project such as a new Boston arena.

Interviews indicated that the maximum interest rate discount on the civic bonds might only be as much as 2 percent off the coupon rate for the main debt financing. These same interviews indicated that perhaps as much as $20,000,000 in civic bonds might be marketable locally. These preliminary estimates indicate that savings in debt service costs might only approximate $400,000 per year from civic bonds. This potentially small reduction in debt service (which, in total, could approximate $13,200,000 per year, as shown in Exhibit 13-1, for general obligation-type debt) coupled with the expected complexities of implementation, led the Study Team to conclude that civic bonds should not be considered as a viable option for arena financing.

Event Co-promotion

Event co-promotion occurs when the arena operator takes on some or all of the financial risk associated with an act that would otherwise be totally borne by the local talent promotor. Under co-promotion, arena management guarantees a minimum payment to the act, regardless of the success in selling out the facility. The arena operator then takes on the tasks (and expenses) of local promotion, publicity, ticket distribution, ticket revenue accounting, and control of expenses for conducting the event in the arena. The potential rewards to the arena, if the act is successful, can be retention of a larger share of the gross ticket receipts. The downside is a potential loss on the event if ticket sales are low and/or the negotiated co-promotion agreement was unfavorable.

More arena operators are taking on the risks and rewards of increased event co-promotion. To do so successfully, the arena must have:

- expert professional management with knowledge of the entertainment and talent promotion industry;
- a competent marketing staff and good knowledge of ticket distribution and publicity

programs which can work in the local area; and,

- o the ability to judge the market demand for the act being promoted.

Use of co-promotion is a real possibility, if the Boston facility can meet the criteria discussed above and especially if professional management is involved. Accordingly, the Study Team felt that a modest increase of 15% to 18% in the basic cashflow from operations estimated for the new arena ($2,871,000 in 1984 dollars; see Exhibit 10-4) could be justified to account for the potential gains from a moderately aggressive co-promotion policy. This additional operating profitability serves to reduce the need for public subsidy of debt service costs and is a viable option to consider as an alternative arena financing strategy.

SUMMARY OF THE VIABLE FINANCING OPTIONS

The financing options that appear viable and, therefore, acceptable as components in planning the arena's basic financing strategy, are as follows (all amounts in 1984 dollars):

- o Usage of a general obligation bonding approach with debt service backed by a combination of arena net cash flow and additional Hotel/Motel tax receipts arising from a potential increase in the tax rate from the current 5.7%. This approach, by itself, could cover debt service on arena construction financing with no further need for additional non-state contributions to the State-financed construction costs or need for supplementary arena revenue sources.

- o If desired, additional revenue sources may be available to supplement arena operating profits and therefore contribute to debt service:

  - A ticket surcharge of $1.00, totalling additional revenue of approximately $2,800,000 per year

  - Retention of ownership to the development parcel, yielding approximately $1,200,000 in lease proceeds annually

  - A modest amount of event co-promotion, leading to improved annual profitability of approximately $500,000 over the basic arena revenue and expense profile.

- Additional outside capital contributions may be available to reduce the amount of publicly-issued debt, and therefore the level of debt service:
  - Reimbursement from the MBTA of $3,300,000 of the cost of land acquisition
  - Contributions from outside private user groups for building equipment costs of approximately $2,800,000.
- Finally, as was previously noted, rental proceeds from suites on the concourse level have already been included in the basic arena operating statement developed in Chapter 10.

PREFERRED FINANCING SCENARIO FOR THE NEW ARENA

A general obligation bonding approach is preferred, meaning that project financing requirements would not include a DSRF nor capitalized construction interest payments and that the State's general obligation would be used only as a secondary means of security. The financing would be issued by the MCCA, with debt service backed by arena net cash flow and dedicated tax revenues that may be available from an increase in the current Hotel/Motel Room Occupancy tax rate of 5.7%. Support for this preferred approach can be summarized as follows:

- Precedents exist throughout the U.S. for this type of funding mechanism for both arenas and convention centers.
- If proper legislative initiatives can be taken, this approach represents a very secure source of funds for payment of arena debt service.
- This approach should represent no impact on the Commonwealth's annual debt service payments, since the general obligation is used only as a secondary means of security for arena debt service payments.
- This approach could represent no additional burden on the State taxpayers or the general fund of the Commonwealth, since a high proportion of Hotel/Motel tax receipts come from out-of-state visitors.
- Complex planning that could assure arena-specific non-state capital or supplemental revenue sources is eliminated as a precondition for proceeding with the design of the arena financing approach.

ECONOMIC IMPACT ANALYSIS

14

ECONOMIC IMPACT ANALYSIS

14

Background

The construction and operation of a new arena in Boston would have both direct and indirect economic effects. The direct effects would include new employment, concession and off-site parking revenues, and income generated by the participants in the arena's construction and ongoing operation. The indirect effects are those attributable to the multiplier effect. These indirect effects include the labor, services, and materials supplied to the arena's direct participants, and increased household purchases of goods and services. The household purchases result from additional employment and wages paid by both direct and indirectly affected businesses.

According to the Boston Convention and Tourist Bureau, the Commonwealth of Massachusetts, Department of Commerce and Development, uses an economic multiplier coefficient of 1.7 for its economic modeling, as developed by Dr. Norman Cournoyer of the University of Massachusetts at Amherst. The Boston Convention and Tourist Bureau believes that this is a conservative estimate for the multiplier effect.

Because the impact of construction would cease when the arena is complete, the estimated economic impacts of construction and ongoing operations were developed separately.

Construction Impact - New Arena

The direct economic impact of the arena's construction consists of the expenditures for each phase of the project, i.e. design, environmental impact, Galleria, etc. The expenditures are based on construction cost estimates developed by the Study Team. A summary of the baseline assumptions is as follows:

- Baseline compensation rates are in 1984 dollars.
- Eighty percent of projected construction labor and seventy-five percent of materials expenditures go to Massachusetts-based operations.
- Land and Garden acquisition costs are excluded. The capital gain to the current owners on the acquisition prices would be a possible input into the Greater Boston economy, but it is not possible to anticipate the amount of sale proceeds that would remain in the local economy.
- Architectural and engineering fees, as well as construction management expenditures, are for fees likely to be paid to Massachusetts firms.
- Construction costs for the private sector development are addressed separately in the next section since this project is viewed as a separate capital project.

Exhibit 14-1 - "New Arena Construction Economic Impact", presents the total estimated direct economic impact of the construction project in inflated dollars over the construction period. The allocation between Massachusetts and non-Massachusetts spending is separately identified.

The direct economic impact for the Commonwealth of Massachusetts associated only with the arena portion of the construction is estimated to be $89.9 million over the period of the construction project.

The total economic impact on the Massachusetts economy attributable to the construction of the new arena is approximately $150 million (see Exhibit 14-2), with an associated 1,780 person-years of labor.

Construction Impact - Renovated Garden

Exhibit 14-3 - "Boston Garden Renovation - Construction Impact" shows the $21 million direct and $36 million total economic impact on

the Massachusetts economy. The full renovation of the Garden would generate 440 person-years of construction-related labor for the Massachusetts economy. Exhibit 14-2 summarizes the total economic impact of renovating the Garden.

Ongoing Operations - New Arena Versus Renovated & Existing Garden

The evaluation of the economic impact attributed to ongoing operations is predicated on the following assumptions:

- The number of events in the new arena is estimated to be 240 versus 232 in a renovated facility and 200 in the existing Garden (see Exhibit 14-2).
- Players, coaching staff and performer compensation remaining in Massachusetts cannot be accurately measured and is not included in the analysis.
- The amount of expenditures by teams, performers, fans and facility management are estimates based on examination of previous economic impact studies, telephone interviews with officials of professional sports arenas, and financial analysis and modeling by the Study Team.
- Fan travel to events is expected to be primarily by automobile. Any changes in the types of patron travel modes as a result of the concurrent North Station transit improvements cannot be precisely estimated. These changes, if they occur, would not have a material affect on the total economic impact of the arena.
- Annual attendance is estimated at 2.8 million patrons in a new arena, 2.6 million patrons in a renovated Garden, and 2.16 million patrons in the existing Garden.
- Additional financial and statistical assumptions are stated in Exhibit 14-4.

The annual economic impact of spending (concessions and operational salaries and wages) in a new arena is estimated to be $39.5 million (measured in 1984 dollars). This is approximately $2.5 million and $8.2 million greater than similarly estimated spending in a renovated and existing Garden, respectively (see Exhibit 14-2).

Annual State sales and income tax revenues from a new arena would increase by $400,000 above those levels estimated at the existing Garden facility; for a renovated Garden, annual State sales and income taxes would be $200,000 higher than the existing Garden.

Convention Use of a New Arena

Conventions generate a sizeable economic impact on a region. The economic impact of only one large convention (a conservative assumption) has been included in the estimated economic benefits arising from a new arena. This estimate of one new convention per year is based on interviews with and estimates of members of the MCCA staff and the Boston Convention and Tourist Bureau. The underlying assumptions for the single convention are as follows:

- 10,000 attendees
- 4 days
- Average daily expenditures of $95/attendee.
- Hotel room tax rate of 5.7%.

Based on the above, the State would realize $350,000 in annual additional tax revenues from this single large convention (see Exhibit 14-2)

This sizable economic impact arising from convention usage of the arena is associated with the new arena option only.

Construction Impact of the Development Parcel

Upon completion and opening of the new arena, the existing Garden would be demolished. One possible use of this site would be to construct twin office buildings totalling approximately 600,000 square feet of rentable space. Approximately 3,000 people would be employed in an office development of this size.

The following assumptions serve as the basis for estimating the economic impact on the Massachusetts economy:

- The midpoint of the development parcel construction is 1994.
- Construction cost per square foot is $100 in 1984 dollars.
- A 5-1/2% annual construction cost inflation was assumed.

The resultant direct economic impact on the Massachusetts economy arising from construction on the development parcel would be $81.6

million, and the total construction economic impact in Massachusetts would be $138.7 million. For Massachusetts, the related number of person-years to construct these office buildings would be 1,170 (see Exhibit 14-2).

Ongoing Operations Resulting from Use of the Development Parcel

Net new employment associated with the two office buildings is estimated to be 20 percent of the total employment of 3,000, or 600 people (see Exhibit 14-2). New annual spending (rent, wages and office operations) is estimated to be $16 million in 1984 dollars. City property tax revenues would increase $2.4 million per year in 1984 dollars, and State revenues would increase $1.15 million (see Exhibit 14-2).

Total Ongoing Benefits New Arena Versus Existing or Renovated

The ongoing benefits of a new arena, a renovated and existing Boston Garden, and the development parcel can be summarized as follows:

- The annual economic benefits (spending, and City and State revenue) of the new arena scenario, including the effects of the development parcel, in 1984 dollars would be $62 million. This compares with $40 million and $33 million for the renovated and existing Garden, respectively.

- Inflated into 1992 dollars (the second full year of new arena operation), the total economic impact of a new arena would exceed that of the existing Garden by $45 million and exceed that of a renovated Garden by $35 million (see Exhibit 14-2).

Qualitative Impact

Assuming that a new multi-purpose arena is built in Boston, there are other economic and non-economic benefits which cannot be estimated in dollar terms. These benefits include:

- North Station Area Revitalization: The new arena would serve as an anchor to the redevelopment of the North Station area and enhance the urban atmosphere of the downtown area.

- National Image: A major sports arena would "represent" the City and State through the visitors to the arena and from nationally televised events. This image contributes to the overall impression potential visitors have of the area.

- Quality of Life: A publicly-owned new arena would increase the variety of entertainment available in the City of Boston, and the new arena would provide a desirable site for civic, collegiate, and high school sports events. A new arena could serve as a civic alternative to the soon-to-be renovated and expanded Hynes Convention Center which, upon completion, will no longer be available for civic functions.

These qualitative impacts are important considerations in making the final arena construction decision.

COMPARING A RENOVATED BOSTON GARDEN TO A NEW ARENA

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COMPARING A RENOVATED BOSTON GARDEN TO A NEW ARENA

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INTRODUCTION

This chapter summarizes the Study Team's key conclusions concerning the feasibility of renovating the Boston Garden or constructing a new arena. The findings address the feasibility criteria outlined in the Introduction of this report. For purposes of clarity and comparison, the findings pertinent to each criteria first address the Boston Garden renovation and next deal with a new arena.

The Study Team cautions that a direct comparison between a renovated Garden and a new arena is not straightforward, for the following reasons:

- The two project options are very different, in terms of the development scope; accordingly, the contrasts in the estimated financial and economic findings must be judged in light of the arena development scenario being described.
- Both project options are dependent upon future occurences, especially concerning potential transportation developments in the North Station area; in this regard, the new arena option is perhaps most affected by future transit planning issues.

- Neither project is comparable to the current conditions at the Boston Garden or North Station area; therefore, the two arena options are compared to each other rather than to the existing Garden.

1) Ability to serve both the public interest for civic functions and the market demand for a variety and quantity of entertainment and public assembly events

The Study Team believes that the Boston Garden could better serve both the public interest and the Boston market potential for a quantity and variety of entertainment only if extensively renovated under public ownership. The issues here are twofold. The first deals with the limitations on reaching full entertainment market potential that are imposed by the basic design of the Boston Garden. As analyzed in Chapter 2, the Study Team has estimated that the Boston market potential for large, arena-type, public entertainment is approximately 240 events per year, with a total expected annual attendance of 2,800,000 patrons. An extensive renovation of the existing Garden would not eliminate all physical constraints to reaching this full market potential, since the capacity under renovation would go down slightly from the current 15,500 seats, obstructed views would remain and patron circulation problems would persist.

The second issue deals with the policies of the building owners in terms of offering an optimum quantity and diversity of entertainment. Over the last ten years, under the current private ownership, the Garden's event profile and quantity has generally not reached the full potential possible in the Boston marketplace. More recently, the number and variety of events offered in the Garden have actually declined. The Study Team believes that the current Garden owner's event scheduling policies would not change dramatically, even if the building were extensively renovated. Thus, the public interest, in terms of a balance and diversity of entertainment options, including civic, high school, cultural, and convention-related uses, would be better served under public ownership.

A new building, built by the public sector, would, as a matter of operating policy, serve the public interest in terms of the variety and quantity of entertainment offered. The estimated number of annual events projected for the new building is 240 and could include several types of public interest events that would be less attractive to a private owners, such as religious gatherings, high school events, cultural and civic events and convention-related uses.

Additionally, a new building would be free of the physical constraints imposed by the Boston Garden that limit service to the full market potential for entertainment. For example, the new arena could contain a maximum of 16,600 fixed seats, with additional capacity for basketball and concerts provided by moveable seating. This would adequately support the estimated market potential attendance of 2,800,000 patrons per year.

2) Generation of operating profits consistent with industry standards and in sufficient amounts to provide for the long-term physical upkeep of the building

The level of estimated operating profitability that could be generated by a publicly-owned, fully renovated Boston Garden was not analyzed in detail by the Study Team, since the principal focus of the Team's activity during the study's second phase was the development of financial and operating detail for a new arena. However, the Study Team believes that a renovated Boston Garden would generate no more (and probably less) operating profits compared to a new arena. This is due to the Garden's potential lower revenues (due to its smaller capacity) and higher operating costs (arising from the conflicting internal space arrangements, the verticality of the building, and the age/design of utility distribution systems). Additionally, even if the renovated Garden's operating profits were the same as a new arena's, the need for substantial additional capital investments can be expected to arise much sooner for a renovated Garden, compared to a new arena, since the useful life of the renovated structure would be shorter.

A new arena in Boston could generate operating profits consistent with industry expectations. Furthermore, the Study Team has included an annual set-aside in the new arena's estimated annual cash flow to assure that future repair and replacement requirements are fully funded without further need for taxpayer investments.

3) Access to sufficient capital necessary to fund renovation or new construction

There is little doubt that the Delaware North Companies, Inc., the parent company for the New Boston Garden Corporation, has the financial capability to fund the Garden owner's proposed renovation program or perhaps even to fund a much more costly extensive renovation. However, the New Boston Garden Corporation, without the backing of Delaware North, may not have the financial capacity to undertake the renovation on its own credit worthiness. Moreover, the mere existence of sufficient financial capacity by the owner or its parent company does not assure that the renovation would be undertaken. The present owners must be able to earn a return on their renovation investment commensurate with the risks and competitive with the returns available from other investment opportunities.

The owners might be able to justify their $15 to $17 million renovation program if the parent company can take full advantage of the tax benefits of future operating losses and the substantial investment tax credits arising from either an Internal Revenue service-approved historic property or qualified rehabilitation designation. These tax benefits could enhance the return on investment, from the perspective of Delaware North Companies. The New Boston Garden Corporation alone may not be able to absorb such tax advantages, and the potential return on their $15 to $17 million investment might be very low. Obviously, the potential returns are even less advantageous if the higher amounts of capital are invested which would be necessary to bring the Garden as close to industry standards as is possible.

The MCCA, with proper legislative approval, could have the ability to fund either a renovation of the Garden or a new arena. Indeed, ownership and investment by the Commonwealth appears to be the only means to assure that either a comprehensive renovation would take place or a new arena would be built.

4) Willingness to create an industry standards facility

Design

It is not possible to correct all of the deficiencies of the Boston Garden even under a comprehensive renovation going beyond the scope of the owner's proposed plan. Seating capacity cannot be increased to adequately serve the market. Obstructed veiws cannot be eliminated without removing balconies, which would further reduce capacity. Operating and patron circulation constraints imposed by the verticality of the Garden would remain, and improvement of the spatial and aesthetic qualities of the pedestrian circulation areas can only be partially achieved.

In contrast to renovating the Boston Garden, a new building can be constructed to meet the industry's standards for a multi-purpose arena. Uniformly high quality sight lines, a simple, efficient and easily understood circulation system, a functional quantity and arrangement of support spaces, and substantial dedicated space for the media would be important features of a state-of-the-art arena. As an air-rights facility, special provisions will be necessary to adequately service the new arena, but the incorporation of a train station into a new building offers distinct advantages over a continuation of the existing situation.

Financing

As previously discussed, the Garden owner's ability and willingness to finance a renovation program costing more than their proposed $15 to $17 million project is highly questionable, from the perspective of the New Boston Garden Corp. The owner's masterplan did not include a financing plan, and the Study Team's request for background financial information was not honored. It is also not clear whether the potential returns, including tax benefits, would be sufficient to induce the Delaware North Companies to risk such a substantial commitment of capital. Therefore, the merits of the full Garden renovation investment must be judged from the perspective of serving the public interest. The Study Team believes that the long term public interest can be better seved through construction of a new facility, despite the higher initial capital costs.

With the backing of the Commonwealth, a construction program resulting in a new, state-of-the-art arena could go forward. The Commonwealth has many options in terms of designing a financing strategy to share the costs and benefits of an arena project among all of the public and private beneficiaries.

5) Minimization of the completed facility's financial and operating costs to the general taxpayers of the Commonwealth

If the Garden were renovated exclusively with private financing, no costs would be borne by the general taxpayers. Going further, if the Garden were extensively renovated under public ownership, the direct costs to the taxpayers of financing the acquisition and renovation project may not be offset by additional city and state tax revenues, since the marginal economic impact of a renovation is quite small. The only way, then, to eliminate any taxpayer costs of a renovation would be to design supplemental arena revenue sources and/or programs to attract outside private captal contributions to the construction program. The Study Team believes that such supplemental arena revenue or outside capital options should not be relied upon to fund any arena construction program and that the potential funding from these outside sources, especially for a renovation program, may be small in comparison to the total construction cost or debt service requirement.

A new arena, because of the sizable new city and state tax revenues that could be generated from related private development, could actually represent a net revenue gain to the general taxpayers of the Commonwealth. By 1992, the state's annual debt service on arena construction borrowings of between $12,500,000 and $13,200,000 could be fully covered by:

- Arena net operating cash flow of up to $7,500,000 per year, assuming implementation of a modest amount of supplemental arena revenue options such as a ticket surcharge.
- New state income and sales tax revenues of approximately $2,800,000.
- New city tax revenues of approximately $3,700,000, arising from additional private sector development opportunities on the land parcel formerly occupied by the Boston Garden.

6) Impact of the facility on Boston's national reputation as a first-class market for professional sports and other public entertainment

A comprehensive renovation of the Boston Garden would substantially enhance Boston's national reputation as a first class sports and entertainment market. Yet, the resultant facility would still fall short of fullfilling all of the market's expectations for the following reasons:

- With the exception of the Montreal Forum, the resultant facility would still be the smallest and the oldest arena among the thirty-seven faciilties housing either an NBA or an NHL franchise.
- Fulfillment of top quality patron comfort, amenities, and seating quality would not be achieved.

- The location of the Garden would continue to block high value development of North Station area property, and the full potential for mutual beneifts between the arena, the transit systems, and the private sector would never be achieved.

- The public would recognize that a renovation is not the optimum long term solution, and questions about the longevity of the renovated facility could soon be raised.

On the other hand, a new arena would put to rest all of the public skepticism concerning the local commitment to the professional sports teams and the availability of a facility that could take full advantage of the strong local market for entertainment and interest in civic functions. A new arena would have a substantially favorable affect on the City's national image and could be the cornerstone for a revitalization of the entire North Station area that has been in the planning stages since at least 1976.

7) Conformity with contemporary life safety and building code standards

A major renovation of the Boston Garden can substantially improve its compliance with contemporary life safety and building code standards. The building currently is in general conformance with applicable building code regulations. Since the Garden is still used for its original purpose as when initially constructed, it is a "grandfathered" structure which has not been required to comply with all provisions of today's building code requirements; however, a major renovation will likely trigger a more thorough application of contemporary code standards. A major renovation could correct most of the deficiencies noted by the Study Team, but the problems of excessively steep balconies and unobstructed view seats causing overcrowding of balcony horizontal circulation would remain. However, even with a major new addition on the north side of the Garden including new horizontal and vertical circulation elements, the overall circulation pattern would remain confusing. While the building has functioned this way since it was constructed, a major emergency requiring quick exiting could be problematic.

A new arena, in addition to being fully compliant with all applicable codes and regulations, would have a much more simple and comprehensible circulation system which would allow for a speedy and safe evacuation of the entire building in ten minutes.

8) Quality of the spectator's entertainment experience

A substantially renovated Boston Garden could improve the spectator's experience in the areas of environmental comfort (air-conditioning) seating (wider, more comfortable seats) circulation (elevators and escalators) and orientation (clear graphics). The Garden can be renovated so that the historical "sense of place" associated with the building is preserved. For some spectators enjoying access to the building's best seats, the preservation of the building's "intimate" character will be beneficial. However, some negative features of the building affecting the spectator's experience cannot be sufficiently improved, including the confusing and inefficient circulation system, the approximately 1,000 obstructed view seats, the quantity and organization of spectator amenities such as concessions and toilets, and the viewing conditions from the skyboxes.

A new arena could offer a superior entertainment experience when compared to a renovated Boston Garden.

Uniformly high-quality sight-lines, a safe, easily-understood and aesthetically pleasant spectator circulation system, an arrangement of concessions offering more variety and efficient service, and superior concourse-level suites with good sight lines would be essential features of a new arena. A new arena, designed with attention to the importance of facilitating maintenance, would be easier to maintain and would create a generally cleaner and more attractive impression. The overall atmosphere and aesthetic quality of a new arena, with use of natural light, pleasantly-scaled spaces, and materials appropriate to places of public assembly would enhance the spectator's enjoyment of attending events at the new facility.

An additional issue is the patron's sense of safety, comfort, and familiarity when attending arena events. These feelings can be enhanced through frequent attendance at a variety of events. A new arena, with event diversity designed to balance public interest and market demand objectives, should broaden the facility's appeal to a wide portion of the general public.

9) Efficiency and ease of operation, from the viewpoint of the major acts, professional sports tenants and other entertainment promoters

The Boston Garden has several major deficiencies which affect its operations. Its major service and support area is remote from the arena floor, thereby requiring additional labor for event set-up and breakdown. Circulation paths for performers and spectators conflict at the arena floor level, and there are inadequate amounts of lockers and dressing rooms. The complex circulation system makes concession food and beverage delivery and trash pick-up difficult and inefficient. There is a lack of large truck loading and unloading areas in the existing building.

The proposed concept for a new arena would offer distinct improvements in the efficiency and ease of operations. Service and support areas are well located with respect to the arena floor, and the building is served by multiple truck docks on two levels. The increased locker and dressing areas are accessible from the arena floor without conflict with spectators, and this area of the building is zoned so as to be easily accessible through its own entrance. Concession support spaces are more generous in the new arena and are organized to enhance profitability. The clean and efficient circulation system should enhance the effectiveness of security personnel in the building.

A comparison highlighting the quantities of various types of spaces in the renovated Garden and a new arena is shown in Exhibits 3-2 and 3-3.

10) Protection of the economic interests of the arena's prime tenants

The Bruins' and Celtics' management believe the teams' economic interest may be best served by a facility smaller than that proposed by the Study Team. The professional teams believe that the Garden's current seating capacity is either too large or about right. A larger building might jeopardize the benefits currently gained from the appearance of a full house at most games and their expectation that strong season ticket demand is not assured over the long run. Additionally, the teams' managements would be concerned that any substantial renovation investment may lead to higher building rents and, in turn, higher ticket prices.

Other major tenants, such as the circus, ice shows, and concert promoters, indicated that the existing Garden (or even a renovated

Garden) does not serve their long term economic interests, due principally to its small capacity, widely varying sightline quality, its age and condition, and its difficult and costly internal operating arrangement.

The Study Team believes for the following reasons that a new arena could benefit the economic interests of all major tenants. In many cases, ticket sales should increase for most major events, owing to the larger capacity and substantially improved seating and patron comforts. Operating costs should be no greater than at the current Garden, and internal operating efficiencies and amenities for the tenants should be vastly improved. Finally, the Study Team has assumed that, like most other publicly-owned facilities, competitive, market-based rentals will be charged and will not be set so as to fully pay for debt service out of arena operating revenues. Included in the tenants' rental agreement would be conventional terms for sharing of concession sales, novelty revenues, and ticket sales to suite patrons. These latter income sources to tenants are not presently offered by the current Garden management.

11) The degree to which a renovated or new arena can serve to stimulate and maximize economic economic revitalization the surrounding area

A renovation of the Boston Garden, by itself, will have only marginal impact on economic revitalization in the North Station area. MBTA-sponsored transportation improvements, including relocation of the elevated Green Line, a new commuter rail station, and new facilities for the Orange Line will be far more decisive in stimulating economic revitalization than improvements to the Boston Garden itself. The owner's current and planned improvements for ground-level retail in the Garden are positive revitalization efforts, but are not significant enough by themselves to have much impact beyond the immediate environment of the building.

The increased number of events in a fully renovated Boston Garden will yield an increase in net spending in the area, especially in bars and restaurants. However, this effect would be partially offset by lower attendance levels due to reduced seating capacity and a probable higher level of food and beverage spending level within the renovated facility.

The location of the Boston Garden along Causeway Street effectively blocks comprehensive development of the North Station site, especially because other portions of the site are bounded by elevated highway ramps. In contrast, the comprehensive arena/train station/development project designed by the Study Team will stimulate economic revitalization in the entire North Station and Bulfinch triangle area. This joint development project places the arena in the location that is least desirable for other uses, and frees up the Causeway Street frontage to become a significant development opportunity. The proposed joint development project, including an arena, train and subway station, and retail and office complex will positively affect the whole area.

The scenario for private development along Causeway Street could include a major retail complex on the lower floors with commercial office space above. Total development area could be approximately 600,000 S.F., resulting in a daily population of 3,000 persons working in the complex. With three levels of retail space overlooking the train Galleria and Atrium and easily accessible to several modes of public transportation, significant numbers of shoppers will be drawn to the area.

12) The degree to which a renovated or new arena can benefit from and/or contribute to the area's long-term transportation development MBTA Projects

A renovation of the Boston Garden is compatible with the MBTA's proposal to relocate the elevated Green Line into a new alignment under the eastern end of the Boston Garden and the City of Boston property to the north. However, extension of the commuter rail tracks and platforms to within sixteen feeet of the Garden as proposed by the MBTA conflicts with a Garden renovation strategy to add additional circulation and arena support spaces on the north side.

More significantly, a private renovation of the Garden leaves a significant transportation terminus in the hands of private ownership, subject to lease provisions that may not be fully in the public interest. Even renovation of the Garden by the public sector places substantial limitations on the way in which a high-quality commuter train and transit station can be developed within the spatial envelope of the Garden's ground floor.

A new air-rights Arena built to the north of the existing Garden opens up exciting opportunities for the development of a train station environment consistent with the projected ridership levels and growing importance of the site. The design concept developed by the Feasibility Study Team shows that the train station functions need not be compromised by the existence of an arena on the site. Rather, through the provision of the train/arena Galleria, a major public space will be provided that is appropriate to the multiple functions of arena and train station lobby. The Galleria will serve as the catalyst for the area's long-term transportation development beyond the positive impact of the Green Line's removal.

Both a renovated Boston Garden or new arena will benefit substantially from the various transportation improvements planned for the North Station area. However, the benefits to a new arena are likely to be more significant for several reasons. A well-designed transit center, including the Galleria and adjacent multi-story retail/commercial development will so dramatically change the image of the area that more and more people become event goers. In addition, a new arena can better serve the occassional conventions requiring a larger assembly space than will be provided in the Hynes Convention Center. The MBTA's Southwest Corridor Project, in conjunction with the proposed North Station improvements will effectively link the Hynes Convention Center with North Station.

The two arena development options will positively affect ridership levels of public transportation, but the new arena will have a dramatically greater effect. A renovated Garden would have more events, but fewer seats, than the existing building, whereas a new arena would have more events and seats than either the existing or renovated Garden. More importantly, mass transit access to the new arena will be encouraged and enhanced by the overall attractiveness of the Galleria as the key ingredient of the train station environment.

DPW Project

The Central Artery/Third Harbor tunnel project is a beneficial yet complicating influence on both a renovated or new arena. For both alternatives, this major DPW project will result in the North Station area being more accessible by automobile than is currently the case. In the case of the Garden renovation scenario, the DPW project requires replacement of the Garden support functions currently located in the Anelex Building at 150 Causeway Street. The most desirable location for a new support function wing would be above the new Green Line tunnel. It should be stressed that whether or not the Commonwealth renovated the Garden or left this action to the private sector, a substantial public expenditure will be required to replace the support functions now housed in the Anelex building.

The construction of a new arena at North Station will also be affected by the Central Artery project but the new arena is not contingent on the Artery project going ahead. Design and construction of the arena's main service ramp will have to be carefully coordinated with the Central Artery depression. Furthermore, the relationship between the timing of the two projects is critical if the Central Artery project requires utility relocation through the new arena site.

13) The degree to which a renovated Garden or new arena is consistent with City and BRA policy for the North Station district's redevelopment	A comprehensive North Station development policy has not yet been formulated by the City. In developing an option for a new arena at North Station, the Study Team has endeavored to incorporate objectives previously expressed concerning urban renewal in the North Station area. The joint development arena/train station/commercial office-retail development project is consistent with the objectives of a major revitalization of the area. Specifically, the arena design concept incorporates provisions for a key north-south pedestrian linkage between Causeway Street and the Charles River to the north. The Study Team believes that continuation of the Garden in its present location inhibits the creation of such a linkage. Furthermore the Garden is not the highest and best use of its site, and it inhibits redevelopment opportunities between its northern edge and the expressway ramps.
14) Generation of economic benefits to the City of Boston	A renovated Boston Garden offers little or no on-going economic benefits to the City of Boston over what the existing facility now generates. Under state ownership, replacement of the existing property taxes paid by the private owners may be subject to payment-in-lieu-of-taxes (PILOT) negotiations between the state and the city.

On the other hand, a new arena could stimulate substantial new economic benefits to the City by:

- Purchase of the city land to the rear of the Garden (Study Team's estimated value is $8,000,000, in 1984 dollars).
- Continuation of the Garden's current property tax revenues through PILOT payments of $400,000 per year (1984 dollars).
- Preparation of the development site by demolition of the Garden and site clearing, at the state's expense (cost savings to the City estimated to be $2,200,000, in 1984 dollars).
- Leasing of the former Garden parcel to private developers, through cooperation between the MCCA and the BRA. One possible scenario is potential one-time linkage payment of $2,500,000 and annual new property taxes of approximately $2,400,000, both in 1984 dollars, or some other mutually acceptable arrangement.
- Stimulation of overall North Station area private development activity and enhanced utilization of the MBTA's facilities.

15) Generation of economic benefits to the Commonwealth of Massachusetts

A renovated Garden may offer a slight improvement in annual state income and sales revenues due to the higher event and attendance potential in a renovated facility. No significant change in employment levels is expected with a renovated Garden.

A new arena, beyond the major one-time economic effects of the large construction project, would offer significant potentials for new annual revenues to the state and other economic activity, such as (in 1984 dollars):

- Combined state sales and income taxes arising from increased attendance and spending in the new arena, plus the marginal economic activity from the development parcel, of approximately $1,350,000 per year.
- New annual employment of approximately 600 person-years; a person year is the equivalent of one full-time job.
- Increased general spending within the state economy of $21,200,000 per year.

IMPLEMENTATION PLANNING FOR A NEW ARENA

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IMPLEMENTATION PLANNING FOR A NEW ARENA

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OVERVIEW

The MCCA, legislative leaders and other key decision makers in the Commonwealth should continue the planning and implementation process. These leaders now have the necessary information to formulate the course of action to permanently solve Boston's needs for a long-term, first-class, multi-purpose arena. Strong public leadership will be required to make a new arena a reality, since the Study Team believes that the preferred course of action relies upon sponsorship by the public sector.

The analyses presented in the Feasiblity Study have provided the information to determine whether the public benefits to be realized from a new arena justify the costs of a publicly-sponsored construction program. This Study has also identified numerous suggestions and recommendations for those actions necessary to implement construction of a new arena at North Station. This Chapter highlights some of the major issues to be resolved as the MCCA moves forward.

DESIGNATION OF A LEAD AGENCY TO COORDINATE FURTHER PLANNING

In formulating the implementation planning issues, the Study Team has assumed that the MCCA should be the lead agency responsible for the coordination of further actions leading to the construction and operation of a new arena. This is an appropriate role for the MCCA, because:

- The arena implementation planning role is a logical extension of the MCCA's existing mandate granted under the legislation that authorized this Feasibility Study. This legislation contains the following wording concerning the multi-purpose arena feasibility study: "...a feasibility study relative to the development and operation by the [MCCA] of a multi-purpose arena ..." (emphasis added).

- In light of its current planning and design efforts for the expansion of the Hynes Convention Center, the MCCA is familiar with the complexities of large, publicly-sponsored construction projects.

- The MCCA is in the best position to optimize the combined usage of both the Hynes and the proposed arena when event scheduling opportunities arise for additional civic, cultural, and convention activities. This is important in light of the planned orientation of the Hynes toward larger, national conventions which will reduce the availabiltiy for smaller convention, exhibition, and civic uses. Coordination of these sometimes overlapping demands will be easier if both facilities are available to be scheduled by the same agency.

- The MCCA is developing close working relationships with the state-wide hotel/motel industry and is well positioned to understand the needs of the industry in formulating the preferred arena funding approach.

- Many opportunities will exist for management, marketing, and operational synergies between the new arena and the Hynes Convention Center. Both facilities will have the management challenges associated with joint marketing and scheduling, and the two facilities will have similarities in purchasing, admissions, ticketing, security, maintenance, and other operational areas. Efficiencies could be obtained if both facilities' operations were the responsibility of one agency.

For these reasons, it is recommended that the MCCA be the lead agency to coordinate further planning for a new arena in Boston.

In the following paragraphs, the Study Team has presented some of the steps and issues that should be addressed by the MCCA and others if a new arena at North Station is to become a reality.

PROJECT APPROVAL

Actions Required by the MCCA

Enactment of additional legislation will be required to provide the authority and resources needed by the MCCA to plan and execute the project. The major components of implementation, up to the point of contracting for final design and consulting services related to construction, are:

- the filing of legislation that provides the necessary powers, authorities, and means of financing to design, construct and operate a new arena
- development of detailed working relationships with the State and City agencies most affected by the construction of a new arena
- liason with major users of the arena and other parties impacted by the financing and construction

Each of these planning areas are described in more detail below.

Legal and Technical Issues Associated With Legislation

The listing below is not meant to be an exhaustive description of all legal and technical matters but rather those areas which became apparent during the work performed for the Study.

- definition of "public purpose" insofar as it relates to the construction and operation of a multi-purpose arena by the MCCA or the Commonwealth in general

- required powers of eminent domain

- extension of the definition of projects for which the MCCA can be responsible

- full definition of the powers and authorities needed by the MCCA to go forward with the planning, design, construction, ownership, operation, management, construction financing, and operational funding for a new arena

  - included would be the authority to use the Construction Management approach to effect the construction project, consistent with the controls and oversight mechanisms for public procurement policies

  - also included would be the necessary contracting authority for operational matters such as professional management, concessions, security, ticket selling and distribution, cleaning, maintenance, and other services as required

- research into the constitutional and statutory issues related to the implementation of the preferred financing approach as described in this Feasibility Study

- full delineation of the types of financing and the sources and amounts of new or existing revenues that the MCCA may be empowered to employ in order to construct and fund the operation of a new arena; issues to be addressed should include:

  - the means by which the MCCA can obtain a source of revenues or access to secure borrowing capability in order to pay for debt service on arena construction financing

  - the MCCA's powers to retain certain supplemental arena revenue sources (such as a potential ticket surcharge)

  - so that these revenues are available to fund debt service or ongoing operations
  - permitting the MCCA to accept contributions from non-state or private parties for the purposes of funding part of the costs of arena construction
  - the power to set aside an annual amount as a reserve for future capital expenditures on major building repairs or improvements
  - other issues as they arise

- research into the implications and limitations, if any, that may arise from Federal laws, statutes, and regulations that govern the use of tax-exempt financing for public facilities such as arenas; examples of potential issues are:
  - the degree to which the preferred arena financing approach is impacted by Federal "cap" restrictions on the use of tax exempt financing for construction projects where the users or beneficiaries are private parties
  - the degree to which the IRS Code may limit the use of tax exempt financing for skyboxes or private suites

Coordinate Planning With Major Affected Federal, State and City Agencies

Successful coordination of the arena financing and construction program will require close working relationships with several State and City offices and agencies. A partial list of such entities is as follows:

- The Governor's Office
- The Mayor of the City of Boston
- The State Executive Office of Administration and Finance
- The State Office of the Inspector General
- The State Executive Office of Economic Development
- Boston Redevelopment Authority
- The Executive Office of Transportation & Construction
- The Massachusetts Bay Transportation Authority
- The State Department of Public Works

- The State Executive Office of Environmental Affairs
- The General Services Administration
- The Greater Boston Convention and Tourist Bureau

Coordination With Other Public Constrution Projects

It is clear from the Study Team's analysis of the North Station site that close coordination with the MBTA's North Station Transportation Improvements Program is necessary. In addition to the required design and Construction Management coordination, there may be opportunities for a combined MCCA and MBTA EIS/EIR process.

Additionally, the arena's design will have to be coordinated with portions of the Central Artery project, including possible subsurface tunnels, utilities and the timing of the Anelex building taking. Despite these uncertainties, however, much forward progress on the arena is possible by concentrating immediately on those implementation issues which are independent of the transportation policies.

Establish Ongoing Working Relationships With Major Users of The New Arena and Other Affected Parties

Collaboration with the major users of the arena will be an important element in the design construction, and operation of the new arena. Early involvement of these parties will provide invaluable and necessary input to the MCCA's planning efforts. Furthermore, involvement of other interested or affected parties will broaden the MCCA's perspective on issues to be addressed during implementation. Examples of important user groups and other local supporters of an arena are:

- The Boston Celtics
- The Boston Bruins
- The Boston Coordinating Committee
- Other major concert and family show promoters
- The North Station business community
- The Statewide hotel/motel business community and/or the Mass Meetings group

Solicitation of Private Sector Participation

The financing approach does not rely on specific levels of non-state or private sector participation in the costs of construction or on the provision of supplemental operating revenues to the arena in order to support debt service. However, the MCCA should aggressively solicit such private or non-state participation. The MCCA should develop the legal and financial criteria under which non-state or private financial participation would be accepted.

Another related issue is the solicitation of a firm commitment for a development project associated with the Causeway Street parcel. Close coordination between the MCCA and the Boston Redevelopment Authority should take place in the formulation of the developer's kit, review of proposals, and final design review.

CONSULTANT SELECTION

Designer

Design consultants should be selected by the MCCA following the necessary legislative and executive actions. Selection should proceed expeditiously according to the Authority's Standard Consultant Selection procedures. The Request for Proposal should include a description of the requirements for coordination with other agencies.

In addition to the Architect who will lead the design team, specialty sub-consultants will include the following disciplines.

- structural engineering
- electrical engineering
- mechanical engineering
- geotechnical engineering
- acoustical engineering
- building code analysis
- food servicing

Construction Manager

The selection of the project's Construction Manager should take place simultaneously with the selection of the design team, but should be retained by the Authority under a separate contract. Selection should be based on the Construction Manager's qualitative experience record and responsiveness to the project requirements. Selection should not be based primarily on fee.

Involvement Of A Professional Arena Management Company

The day-to-day operational management of a large, multi-purpose arena is a complex responsibility. There are unique aspects to daily operations that require competent, experienced management staff in key positions. Large crowds, coming at peak intervals, are typical. Constant attention to controls over costs and revenues is required. The complexities of arena operations have led to the formation of management companies which specialize in the operation of large, public assembly facilities. The MCCA should consider the use of such services, in three ways:

- as consultants in the team of professionals hired to perform final design services,
- as participants on the construction management team, and
- as contract operators of the new arena.

Environmental Impact Consultant

Although there has been a substantial amount of environmental impact analysis work done as part of the MBTA's and DPW's projects in the North Station area, the arena itself will likely require an Environmental Impact Report (EIR). The consultant for this work should be chosen as soon as possible following selection of the design team. Consideration should be given to an EIR consultant selection process that is coordinated with the MBTA.

The Design Process

Following selection of the key project consultants, the design of the arena can proceed. Since coordination of transportation facility design and arena design is so critically important, the MBTA and the MCCA should designate co-project managers who approach the project with a shared commitment to comprehensive coordination. Given the complexity of other public policy issues, including the BRA's urban renewal interests, consideration should be given to appointing an overall North Station Project Director who has broad powers to lead and implement a coordinated design process.

Design Approval Process

Early in the design process, the design team, in conjunction with the Construction Manager, should prepare a schedule for seeking all of the approvals necessary before construction can begin. It is essential that the approvals process be structured in such a way that does not retard the project's start-up and progress.

Included among the approval cycle will be the Department of Public Safety, Architectural Barriers Board, various City agencies, Urban Mass Transit Administration, and others.

Need For A Full Financial Feasibility Study To Support The Final Financing Approach

At the time of writing of this report, the need for a formal feasibility study of forecast future financial results as part of the final financing plan is not known. The MCCA and its financial advisors should determine if such is required and, if so, the manner and timing of consultant selection that will coincide with the issuance of a public debt offering.

Property Acqusition

The research necessary for the property acquisition process should begin as soon as possible following the project's approval. Negotiations with the New Boston Garden Corporation, City of Boston, and Massachusetts General Hospital should proceed expeditiously. Further attempts to determine the ownership of Accolon way should be made, and coordination with the MBTA's and DPW's right-of-way departments should begin. The schedule of required acquisitions should be refined in coordination with the actual construction schedule.

Construction

The MCCA should establish inspection and review procedures, including a mechanism for supervision of the Construction Manager. Because of the joint nature of the first construction phase, the review and approval process is likely to be complex. Strategies for coordination with the MBTA's own construction review and inspection process should be established well in advance of the construction period.

Planning for On-going Operations

Numerous details of the internal operation arrangements for the new arena will have to specified in advance of opening night. The Study Team recommends that the MCCA should anticipate these complexities far in advance of construction completion so that the opening of the new arena will be as problem-free possible. Some of the important operational and contractual issues which are currently identifiable are presented below:

o development of an advance marketing program to schedule events prior to construction completion; this might be accomplished through the MCCA's national marketing activity that is being developed for the Hynes Convention Center

- negotiations of rental agreements and revenue sharing provisions with the professional sports tenants
- planning for an orderly physical move of prime tenants' property and essential equipment from the Boston Garden
- negotiation of a professional management contract
- logistical planning for the arena patron's temporary means of access during demolition of the Garden and completion of the Galleria
- negotiation of key arena support and supply contracts, such as:
  - concessionnaire
  - security company
  - cleaning and maintenance
  - ticket distribution
- advance marketing of advertising space and contracts
- development of a marketing program, pricing schedule, and allocation policy for the concourse suites
- establishment of a booking policy that can accommodate civic, cultural, and public interest events
- development of staffing policies for the new arena

As previously stated, all of the planning issues that will arise during the MCCA's efforts to implement a new arena cannot be anticipated. The foregoing discussion outlines some of the major areas for planning focus and offers more detail on near term issues than on longer term considerations. Coordination of the various public and private interests associated with a new arena in Boston will be a significant undertaking but an essential ingredient if the planning efforts are to succeed.

EXHIBITS

GARDEN-ARENA SPORTS NEWS

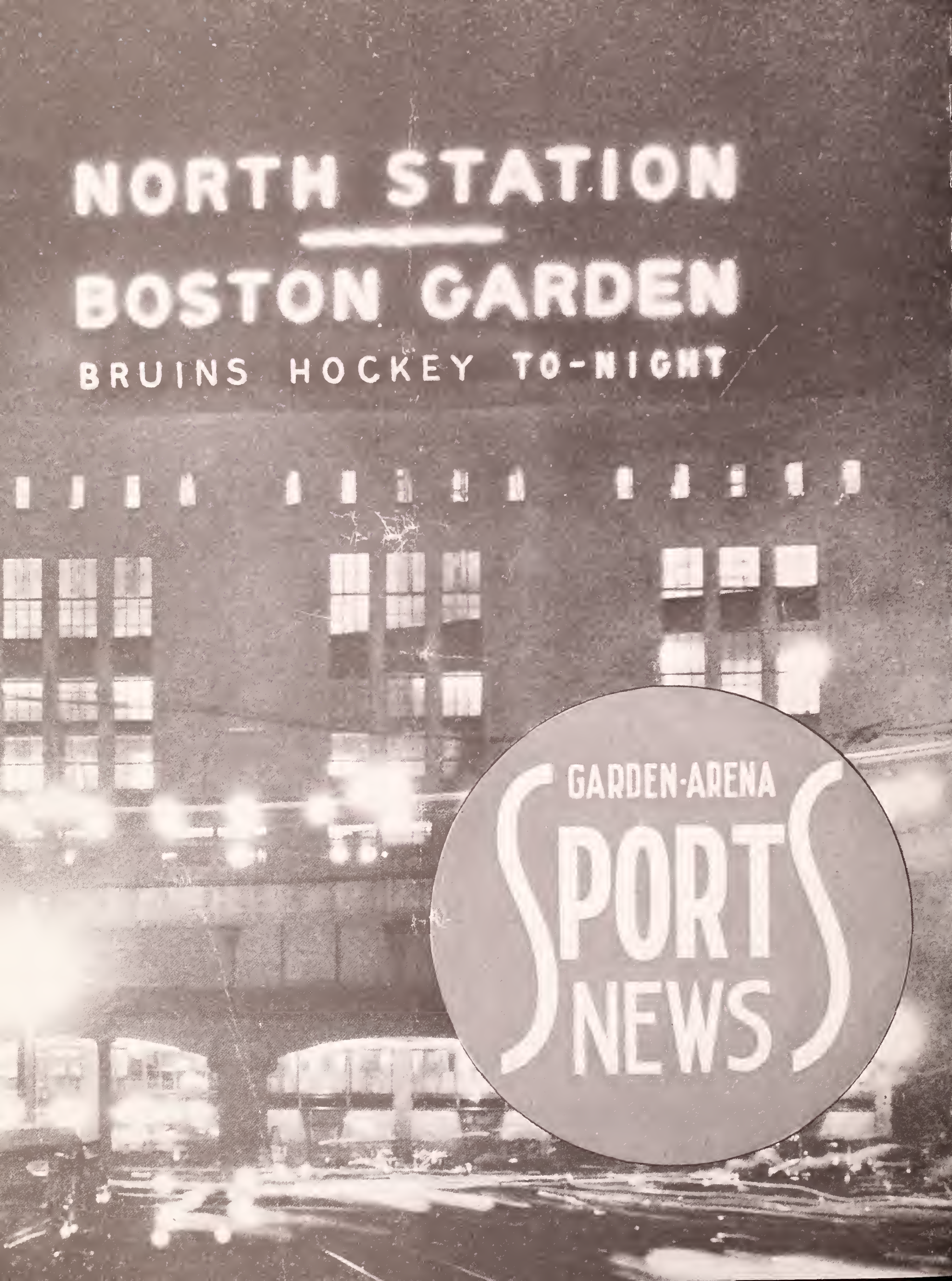

NORTH STATION
BOSTON GARDEN
BRUINS HOCKEY TO-NIGHT

EXHIBIT 1-1

FACILITIES INCLUDED IN SURVEY DATA COLLECTION

	MAJOR LEAGUE FRANCHISE		INDUSTRY SURVEY		INTERVIEW		
CITY - FACILITY	NBA	NHL	SENT	RESPONSE	ON-SITE	PHONE	OTHER SOURCES OF DATA
1. ATLANTA - OMNI	HAWKS		X	X			IAAM,NBA,(4)
2. BOSTON GARDEN	CELTICS	BRUINS	X		X		IAAM,NBA,NHL,(1),(2),(3)
3. BUFFALO MEMORIAL AUDITORIUM		SABRES	X	X		X	IAAM,NHL,(2)
4. CALGARY - OLYMPIC SADDLE DOME		FLAMES	X	X		X	IAAM,NHL
5. CHICAGO STADIUM	BULLS	BLACKHAWKS	X			X	IAAM,NBA,NHL,(3),(4)
6. CLEVELAND - COLISEUM, RICHFIELD OH	CAVILIERS		X	X			IAAM,NBA,(4)
7. DALLAS REUNION ARENA	MAVERICKS		X	X	X		IAAM,NBA,(4)
8. DENVER - McNICHOLS SPORTS ARENA	NUGGETS		X	X		X	IAAM,NBA,(4)
9. DETROIT - JOE LOUIS ARENA		REDWINGS	X			X	IAAM,NHL
10. EDMONTON NORTHLANDS COLISEUM		OILERS	X	X			IAAM,NHL
11. HARTFORD CIVIC ARENA		WHALERS	X	X	X		IAAM,NHL
12. HOUSTON - SUMMIT	ROCKETS		X	X	X		IAAM,NBA,(4)
13. INDIANAPOLIS - MARKET SQUARE ARENA	PACERS		X	X		X	IAAM,NBA,(4)
14. KANSAS CITY - KEMPER ARENA	KINGS		X	X	X		IAAM,NBA,(4)
15. LOS ANGELES FORUM	LAKERS	KINGS	X				IAAM,NBA,NHL,(4)
16. MILWAUKEE - M.E.C.C.A.	BUCKS		X	X			IAAM,NBA,(4)
17. MINNEAPOLIS - MET CENTER		NORTH STAR	X			X	IAAM,NHL
18. MONTREAL - FORUM		CANADIENS	X		X		IAAM,NHL
19. NASSAU VETERANS MEMORIAL COLISEUM		ISLANDERS	X	X		X	IAAM,NHL
20. NEW JERSEY MEADOWLANDS - BYRNE ARENA	NETS	DEVILS	X	X	X		IAAM,NBA,NHL,(2),(3),(4)
21. NEW YORK - MADISON SQUARE GARDEN	KNICKERBOCKERS	RANGERS	X	X		X	IAAM,NBA,NHL,(2),(3),(4)
22. OAKLAND-ALAMEDA COUNTY COLISEUM	WARRIORS		X				IAAM,NBA,(4)
23. PHILADELPHIA - SPECTRUM	76ERS	FLYERS	X	X	X		IAAM,NBA,NHL,(3),(4)
24. PHOENIX - ARIZ VET MEMORIAL COLISEUM	SUNS		X	X			IAAM,NBA,(4)
25. PITTSBURGH CIVIC ARENA		PENGUINS	X	X		X	IAAM,NHL
26. PONTIAC SILVERDOME	PISTONS		X	X			IAAM,NBA,(4)
27. PORTLAND COLISEUM (OREGON)	TRAILBLAZERS		X			X	IAAM,NBA,(4)
28. PROVIDENCE CIVIC CENTER			X	X	X		IAAM
29. QUEBEC - THE COLISEUM		NORDIQUES	X	X			IAAM,NHL
30. ST LOUIS ARENA		BLUES	X			X	IAAM,NHL,(3)
31. SALT LAKE CITY - SALT PALACE	JAZZ		X	X			IAAM,NBA,(4)
32. SAN ANTONIO - HEMISFAIR ARENA	SPURS		X	X			IAAM,NBA,(4)
33. SAN DIEGO SPORTS ARENA	CLIPPERS		X				IAAM,NBA,(4)
34. SEATTLE KINGDOME	SUPERSONICS		X				IAAM,NBA,(4)
35. SPRINGFIELD CIVIC CENTER			X				IAAM
36. TORONTO MAPLE LEAF GARDEN		MAPLE LEAF	X			X	IAAM,NHL
37. VANCOUVER - PACIFIC COLISEUM		CANUCKS	X	X		X	IAAM,NHL
38. WASHINGTON D.C. - CAPITAL CENTRE	BULLETS	CAPITALS	X	X	X		IAAM,NBA,NHL,(3),(4)
39. WINNEPEG ARENA		JETS	X	X		X	IAAM,NHL
40. WORCESTER - CENTRUM			X	X	X		IAAM,(1),(3)

NOTES:
(1)MAJOR USERS (TENANTS) OF FACILITY
(2)PRIOR INDUSTRY ENGAGEMENTS - TOUCHE ROSS & CO
(3)MANAGEMENT AT OTHER FACILITIES - FACILITY MANAGEMENT COMPANIES
(4)KIDDER PEABODY - REPORT ON THE ARENAS OF THE NBA

EXHIBIT 1-2

CRITERIA FOR SELECTION OF FACILITIES FOR ON-SITE INSPECTIONS

	Proximity to Boston	Year of Construction/	"State-of-the-Art"	Major Renovation	Downtown Location	NHL	NBA	Public Ownership	Private Ownership	Public Operation	Private Operation
Hartford Civic Center	X	1974		X	X	X		X		X	
Providence Civic Center	X	1972			X			X		X	
Worcester Centrum	X	1982			X			X			X
Montreal Forum		1925/ 1968		X	X	X			X		X
Capital Centre Landover, Maryland		1973				X	X		X		X
Houston Summit		1975	X				X	X			X
Dallas Reunion Arena		1980			X		X	X		X	
Kemper Arena, Kansas City		1974					X	X		X	
Byrne Arena Meadowlands, NJ		1981	X			X	X	X		X	
The Spectrum Philadelphia		1967			X	X	X	X			X
Boston Garden	X	1928			X	X	X		X		X

EXHIBIT 1-3

FACILITIES HAVING BOTH NBA AND NHL TENANTS

FACILITY	TENANTS	1983 # OF EVENTS	SEATS (1)
1. MADISON SQUARE GARDEN	KNICKS/RANGERS	480	20,000
2. LOS ANGELES FORUM	LAKERS/KINGS	NOT AVAILABLE	18,679
3. CHICAGO STADIUM	BULLS/BLACK HAWKS	225	20,000
4. MEADOWLANDS BYRNE ARENA	NETS/DEVILS	230	20,130
5. PHILADELPHIA SPECTRUM	76ERS/FLYERS	245	20,000
6. CAPITAL CENTRE	BULLETS/CAPITALS	230	19,000
7. BOSTON GARDEN	CELTICS/BRUINS	198	15,509

NOTES:

(1) MAXIUM CAPACITY LISTED IN AUD/ARENA STADIUM GUIDE, 1984 EDITION

EXHIBIT 1-4

AGE OF FACILITIES HAVING NBA AND/OR NHL FRANCHISES

CITY - FACILITY	YEAR OPENED	AGE (YEARS)	COMMENTS
1. CALGARY - OLYMPIC SADDLE DOME	1983	1	
2. NEW JERSEY MEADOWLANDS - BYRNE ARENA	1981	3	ADDING A $4 MILLION 300 SEAT RESTAURANT IN 1984
3. DALLAS REUNION ARENA	1980	4	
4. DETROIT - JOE LOUIS ARENA	1979	5	
5. SEATTLE KINGDOME	1976	8	
6. DENVER - McNICHOLS SPORTS ARENA	1975	9	
7. HOUSTON - SUMMIT	1975	9	
8. PONTIAC SILVERDOME	1975	9	$4.8 MILLION IN RENOVATION & EXPANSION SINCE 1978
9. CLEVELAND - COLISEUM, RICHFIELD OH	1974	10	
10. EDMONTON NORTHLANDS COLISEUM	1974	10	$2.3 MILLION IN 1980-81 FOR SEATS, SCORE BOARDS, & HOCKEY BOARDS
11. HARTFORD CIVIC ARENA	1974	10	ROOF COLLAPSED 1978, REOPENED IN 1980 AFTER EXPANSION & REPAIR
12. INDIANAPOLIS - MARKET SQUARE ARENA	1974	10	$1.5 MILLION SPENT IN 1979-80
13. KANSAS CITY - KEMPER ARENA	1974	10	REPLACED ROOF STRUCTURE & ADDED CATWALKS IN 1979 FOR $4 MILLION
14. WASHINGTON D.C. - CAPITAL CENTRE	1973	11	
15. ATLANTA - OMNI	1972	12	
16. NASSAU VETERANS MEMORIAL COLISEUM	1972	12	$0.4 MILLION IN RENOVATION & EXPANSION 1981-83
17. SALT LAKE CITY - SALT PALACE	1969	15	
18. VANCOUVER - PACIFIC COLISEUM	1969	15	$2 MILLION CANADIAN FOR RENOVATION & ENHANCEMENTS IN 1984
19. NEW YORK - MADISON SQUARE GARDEN	1968	16	ADDITION OF SKY BOXES 1971-73
20. SAN ANTONIO - HEMISFAIR ARENA	1968	16	$5 MILLION EXPANSION IN 1978
21. LOS ANGELES FORUM	1967	17	
22. MINNEAPOLIS - MET CENTER	1967	17	
23. PHILADELPHIA - SPECTRUM	1967	17	$10 MILLION IN RENOVATION & EXPANSION SINCE 1970
24. OAKLAND-ALAMEDA COUNTY COLISEUM	1966	18	
25. SAN DIEGO SPORTS ARENA	1966	18	
26. PHOENIX - ARIZ VET MEMORIAL COLISEUM	1965	19	$1.8 MILLION IN RENOVATION & EXPANSION SINCE 1973
27. PITTSBURGH CIVIC ARENA	1962	22	$3.8 MILLION IN RENOVATION & EXPANSION SINCE 1976
28. PORTLAND COLISEUM (OREGON)	1960	24	
29. WINNEPEG ARENA	1954	30	ADDED 5,000 SEATS IN 1979
30. MILWAUKEE - M.E.C.C.A.	1950	34	NEW ROOF 1980 - $0.3 MILLION
31. QUEBEC - THE COLISEUM	1949	35	$20 MILLION CANADIAN TO EXPAND & MODERNIZE BUILDING IN 1980
32. BUFFALO MEMORIAL AUDITORIUM	1939	45	$14 MILLION IN RENOVATIONS SINCE 1970
33. CHICAGO STADIUM	1934	50	
34. TORONTO MAPLE LEAF GARDEN	1931	53	SEVERAL RENNOVATIONS SINCE 1931
35. ST LOUIS ARENA	1929	55	
36. BOSTON GARDEN	1928	56	
37. MONTREAL - FORUM	1925	59	1968: MAJOR RENOVATION FOR $10 MILLION CANADIAN. IN 1975, AIR CONDITIONED FOR $1 MILLION CANADIAN

EXHIBIT 1-5

ANALYSIS OF FACILITY AGES

AGE	NUMBER	PERCENT OF TOTAL	CUMULATIVE PERCENT
0 TO 4 YEARS	3	8%	8%
5 TO 9 YEARS	5	14%	22%
10 TO 19 YEARS	18	49%	70%
20 TO 29 YEARS	2	5%	76%
30 TO 39 YEARS	3	8%	84%
40 TO 49 YEARS	1	3%	86%
50 TO 59 YEARS	5	14%	100%
TOTAL	37	100%	

AVERAGE FACILITY AGE: 17 YEARS OLD

MEDIAN FACILITY AGE: 16 YEARS OLD

SOURCE: See Exhibit 1-4

EXHIBIT 1-6

COST OF FACILITIES BUILT SINCE 1970, IN 1984 DOLLARS

FACILITY	ORIGINAL COST ($ MILLIONS)	YEAR BUILT	INFLATED TO 1984 USING NATIONAL (1) CONSTRUCTION INDEX ($ MILLIONS)	COMMENTS
1. NEW JERSEY MEADOWLANDS - BYRNE ARENA	88	1981	108	
2. SEATTLE KINGDOME	60	1976	108	DOMED STADIUM - EXCLUDED FROM AVERAGE
3. PONTIAC SILVERDOME	55	1975	102	DOMED STADIUM - EXCLUDED FROM AVERAGE
4. CALGARY - OLYMPIC SADDLE DOME	65 (2)	1983	68	
5. CLEVELAND - COLISEUM, RICHFIELD OH	32	1974	66	
6. NASSAU VETERANS MEMORIAL COLISEUM	22	1972	53	
7. KANSAS CITY - KEMPER ARENA	24	1974	49	
8. INDIANAPOLIS - MARKET SQUARE ARENA	23	1974	47	
9. ATLANTA - OMNI	17	1972	41	
10. WASHINGTON D.C. - CAPITAL CENTRE	18	1973	40	
11. DETROIT - JOE LOUIS ARENA	27	1979	40	
12. DALLAS REUNION ARENA	27	1980	36	SITE PREMIUM FOR FLOOD PLAIN DRAINAGE
13. HOUSTON - SUMMIT	18	1975	34	
14. WORCESTER - CENTRUM	28	1982	32	
15. PROVIDENCE CIVIC CENTER	12	1972	29	
16. EDMONTON NORTHLANDS COLISEUM	14 (2)	1974	28	
17. DENVER - McNICHOLS SPORTS ARENA	10	1975	19	
		AVERAGE	46	MEDIAN 41

NOTES:

(1) AVERAGE OF 30 U.S. CITIES - CONCORDIA MANAGEMENT CORP.
(2) CANADIAN DOLLARS ASSUMED EQUAL TO $0.85 U.S.

NEW YORK - MADISON SQUARE GARDEN

- BUILT IN 1968 FOR AN ESTIMATED $50 MILLION
- BUILT OVER PENNSYLVANIA STATION
- HIGH SITE PREMIUM FOR AIR RIGHTS LOCATION

- ESTIMATED COST INFLATED TO 1984: $141 MILLION

EXHIBIT 1-7

SUMMARY OF MAJOR ORIGINAL CONSTRUCTION COST FINANCING APPROACHES

MAJOR FUNDING CATEGORY	PRIMARY FUNDING SOURCE	SECONDARY FUNDING SOURCE
PUBLIC	1. Revenue Bonds: - Facility revenue bonds for city or authority - Authority revenue bonds with guarantee of city/state - Revenue bonds with special tax dedication	1. Federal project grants 2. State project grants 3. Land grants/gifts
	2. G. O. of city or state	4. Related authority bonds: - Convention Center Authority - Parking Authority - Water & Sewer Authority - Transit Authority
	3. Special funding bonds backed by special purpose tax receipts	
PRIVATE	1. Debt - private mortgage and/or pledge of building and/or sports team revenues.	1. Gifts/fund drives 2. Special privilege bonds (like seat preference bonds)
	2. Debt - IRB/IDB tax exempt bonds	3. Land swaps
	3. Equity from private owner	4. Real estate tax preference agreements 5. Private contributions to building construction (e.g. skyboxes, scoreboard, concession equipment)

EXHIBIT 1-8

OWNERSHIP OF FACILITIES HAVING NBA AND/OR NHL FRANCHISES

	MAJOR LEAGUE FRANCHISE		FACILITY OWNERSHIP	
CITY - FACILITY	NBA	NHL	PUBLIC	PRIVATE
1. ATLANTA - OMNI	HAWKS		X	
2. BOSTON GARDEN	CELTICS	BRUINS		X
3. BUFFALO MEMORIAL AUDITORIUM		SABRES	X	
4. CALGARY - OLYMPIC SADDLE DOME		FLAMES	X	
5. CHICAGO STADIUM	BULLS	BLACKHAWKS		X
6. CLEVELAND - COLISEUM, RICHFIELD OH	CAVILIERS			X
7. DALLAS REUNION ARENA	MAVERICKS		X	
8. DENVER - McNICHOLS SPORTS ARENA	NUGGETS		X	
9. DETROIT - JOE LOUIS ARENA		REDWINGS	X	
10. EDMONTON NORTHLANDS COLISEUM		OILERS	X	
11. HARTFORD CIVIC ARENA		WHALERS	X	
12. HOUSTON - SUMMIT	ROCKETS		X	
13. INDIANAPOLIS - MARKET SQUARE ARENA	PACERS		X	
14. KANSAS CITY - KEMPER ARENA	KINGS		X	
15. LOS ANGELES FORUM	LAKERS	KINGS		X
16. MILWAUKEE - M.E.C.C.A.	BUCKS		X	
17. MINNEAPOLIS - MET CENTER		NORTH STARS	X	
18. MONTREAL - FORUM		CANADIENS		X
19. NASSAU VETERANS MEMORIAL COLISEUM		ISLANDERS	X	
20. NEW JERSEY MEADOWLANDS - BYRNE ARENA	NETS	DEVILS	X	
21. NEW YORK - MADISON SQUARE GARDEN	KNICKERBOCKERS	RANGERS		X
22. OAKLAND-ALAMEDA COUNTY COLISEUM	WARRIORS		X	
23. PHILADELPHIA - SPECTRUM	76ERS	FLYERS	X	
24. PHOENIX - ARIZ VET MEMORIAL COLISEUM	SUNS		X	
25. PITTSBURGH CIVIC ARENA		PENGUINS	X	
26. PONTIAC SILVERDOME	PISTONS		X	
27. PORTLAND COLISEUM (OREGON)	TRAILBLAZERS		X	
28. QUEBEC - THE COLISEUM		NORDIQUES	X	
29. ST LOUIS ARENA		BLUES		X
30. SALT LAKE CITY - SALT PALACE	JAZZ		X	
31. SAN ANTONIO - HEMISFAIR ARENA	SPURS		X	
32. SAN DIEGO SPORTS ARENA	CLIPPERS			X
33. SEATTLE KINGDOME	SUPERSONICS		X	
34. TORONTO MAPLE LEAF GARDEN		MAPLE LEAFS		X
35. VANCOUVER - PACIFIC COLISEUM		CANUCKS	X	
36. WASHINGTON D.C. - CAPITAL CENTRE	BULLETS	CAPITALS		X
37. WINNEPEG ARENA		JETS	X	
			27 / 37	10 / 37
			73%	27%

EXHIBIT 1-9

SUMMARY OF INTERNAL EXECUTIVE MANAGEMENT APPROACHES

	NUMBER	PERCENTAGE
STAFF OF PUBLIC OWNER	19	54%
STAFF OF PRIVATE OWNER	8	23%
CONTRACT MANAGEMENT OF PUBLIC OWNER	7	20%
CONTRACT MANAGEMENT OF PRIVATE OWNER	1	3%
TOTAL	35	100%
TOTAL PRIVATE MANAGEMENT	16	46%
PRIVATE MANAGEMENT RELATED TO TEAM OWNERSHIP	14	88% (1)

NOTES: (1) Percent of total private management.

EXHIBIT 1-10

SUMMARY OF INTERNAL SERVICE MANAGEMENT APPROACHES

SERVICE	PERCENTAGE OF SURVEY RESPONDENTS BY SERVICE APPROACH TYPE			
	IN - HOUSE STAFF (1)	OUTSIDE CONTRACTOR	COMBINATION	OTHER
CONCESSIONS	22%	67%	4%	4% - PRIMARY TENANT 4% - CONTRACTOR RELATED TO OWNER
SECURITY	36%	44%	12%	4% - CONTRACTOR RELATED TO OPERATOR 4% - CITY FACILITY USES OFF-DUTY POLICE OFFICERS
CLEANING	65%	27%	4%	4% - OUTSIDE INDIVIDUAL CONTRACTORS HIRED ON A PART-TIME, AS-NEEDED BASIS
BOX OFFICE	73%	12%	12%	4% - EVENT PROMOTORS
TICKET DISTRIBUTION	20%	48%	24%	4% - EVENT PROMOTORS 4% - COMBINATION OF STAFF, OUTSIDE CONTRACTORS, & EVENT PROMOTORS
PARKING OPERATIONS	29%	32%		4% - PRIMARY TENANT 11% - CONTRACTOR RELATED TO OWNER OR OPERATOR 25% - PARKING NOT OPERATED BY FACILITY
MAINTENANCE	88%	8%	4%	
ADVERTISING / PROMOTIONS	71%	4%	8%	8% - EVENT PROMOTORS 4% - TENANTS AND STAFF 4% - COMBINATION OF STAFF, OUTSIDE CONTRACTORS, & EVENT PROMOTORS

NOTE: (1) INCLUDES ALL EMPLOYEES PAID THROUGH FACILITY'S PAYROLL

EXHIBIT 1-11

SEATING CAPICITY BY EVENT CONFIGURATION

CITY - FACILITY	HOCKEY	BASKETBALL	CONCERTS
	EVENT CONFIGURATION (A)		
1. ATLANTA - OMNI	15,600	16,900	17,100
2. BOSTON GARDEN	14,385	15,320	15,509
3. BUFFALO MEMORIAL AUDITORIUM	16,473	na	18,000
4. CALGARY - OLYMPIC SADDLE DOME	16,700	na	20,700
5. CHICAGO STADIUM	17,263	17,374	20,000
6. CLEVELAND - COLISEUM, RICHFIELD OH	18,000	19,000	19,000
7. DALLAS REUNION ARENA	17,100	17,700	18,800
8. DENVER - McNICHOLS SPORTS ARENA	16,500	17,500	19,500
9. DETROIT - JOE LOUIS ARENA	19,275	na	21,572
10. EDMONTON NORTHLANDS COLISEUM	17,499	na	18,500
11. HARTFORD CIVIC ARENA	14,587	na	16,269
12. HOUSTON - SUMMIT	14,800	15,462	17,048
13. INDIANAPOLIS - MARKET SQUARE ARENA	15,861	17,150	18,250
14. KANSAS CITY - KEMPER ARENA	16,018	16,682	17,634
15. LOS ANGELES FORUM	16,005	17,505	18,679
16. MILWAUKEE - M.E.C.C.A.	8,946	11,052	11,649
17. MINNEAPOLIS - MET CENTER	15,184	na	16,800
18. MONTREAL - FORUM	16,074	na	18,300
19. NASSAU VETERANS MEMORIAL COLISEUM	15,800	17,000	18,200
20. NEW JERSEY MEADOWLANDS - BYRNE ARENA	19,023	20,124	21,600
21. NEW YORK - MADISON SQUARE GARDEN	17,500	18,500	20,000
22. OAKLAND-ALAMEDA COUNTY COLISEUM	na	13,335	15,000
23. PHILADELPHIA - SPECTRUM	17,800	17,800	20,100
24. PHOENIX - ARIZ VET MEMORIAL COLISEUM	na	14,660	16,500
25. PITTSBURGH CIVIC ARENA	16,033	16,576	17,588
26. PONTIAC SILVERDOME (EXCLUDED FROM AVERAGE)	na	35,000	80,638
27. PORTLAND COLISEUM (OREGON)	10,300	12,666	13,600
28. PROVIDENCE CIVIC CENTER	10,888	12,468	14,000
29. QUEBEC - THE COLISEUM	15,300	na	16,800
30. ST LOUIS ARENA	17,968	na	19,681
31. SALT LAKE CITY - SALT PALACE	10,900	12,743	13,075
32. SAN ANTONIO - HEMISFAIR ARENA	na	16,000	16,000
33. SAN DIEGO SPORTS ARENA	na	13,753	14,585
34. SEATTLE KINGDOME (EXCLUDED FROM AVERAGE)	na	40,192	65,000
35. SPRINGFIELD CIVIC CENTER	na	na	10,000
36. TORONTO MAPLE LEAF GARDEN	17,000	na	20,000
37. VANCOUVER - PACIFIC COLISEUM	15,800	15,800	17,500
38. WASHINGTON D.C. - CAPITAL CENTRE	17,000	18,000	20,400
39. WINNEPEG ARENA	15,250	na	na
40. WORCESTER - CENTRUM	na	na	13,000

NOTES:

(A) DIFERENCES IN REPORTED SEATING CAPACITIES RESOLVED BY THE FOLLOWING HEIRARCHY:

1) MANAGEMENT RESPONSE TO SURVEY OR INTERVIEW
2) 1983-84 OFFICIAL GUIDE - NHL
3) 1983-84 NBA GUIDE
4) AUD/ARENA STADIUM 1984 INTERNATIONAL GUIDE & DIRECTORY

na - not available

EXHIBIT 1-12

SEATING CAPACITY SUMMARY

	EVENT CONFIGURATION		
	HOCKEY	BASKETBALL	CONCERTS
HIGH:			
DETROIT - JOE LOUIS ARENA	19,275		
NEW JERSEY MEADOWLANDS - BYRNE ARENA		20,124	21,600
LOW:			
MILWAUKEE - M.E.C.C.A.	8,946	11,052	11,649
AVERAGE:	15,869	16,192	18,145
MEDIAN:	16,025	17,000	18,225

NOTE: DOMED STADIUMS, WORCESTER, PROVIDENCE AND SPRINGFIELD ARE EXCLUDED FROM AVERAGES

EXHIBIT 1-13

MARKET SIZE SERVICED BY FACILITY

	ARBITRON TV MARKET - ADI (AREA OF DOMINANT INFLUENCE)			1980 U.S. CENSUS - SMSA´s (STANDARD METROPOLITAN STATISTICAL AREAS)		
CITY - FACILITY	ADI	POPULATION (MILLIONS)	ADI RANKING	SMSA	POPULATION (MILLIONS)	SMSA RANKING
1. NEW YORK - MADISON SQUARE GARDEN	NEW YORK	17.8	1	NEW YORK	9.1	1
2. NEW JERSEY MEADOWLANDS - BYRNE ARENA	NEW YORK	17.8	1	NEW YORK	9.1	1
3. NASSAU VETERANS MEMORIAL COLISEUM	NEW YORK	17.8	1	NASSAU-SUFFOLK	2.6	11
4. LOS ANGELES FORUM	LOS ANGELES	11.9	2	LOS ANGELES-LONG BEACH	7.5	2
5. CHICAGO STADIUM	CHICAGO	8.5	3	CHICAGO	7.1	3
6. PHILADELPHIA - SPECTRUM	PHILADELPHIA	7.0	4	PHILADELPHIA	4.7	4
7. BOSTON GARDEN	BOSTON	5.4	5	BOSTON	2.8	10
8. WORCESTER - CENTRUM	BOSTON	5.4	5	WORCESTER	0.4	105
9. OAKLAND-ALAMEDA COUNTY COLISEUM	SAN FRANCISCO	5.3	6	SAN FRANCISCO-OAKLAND	3.3	6
10. DETROIT - JOE LOUIS ARENA	DETROIT	4.7	7	DETROIT	4.4	5
11. PONTIAC SILVERDOME	DETROIT	4.7	7	DETROIT	4.4	5
12. WASHINGTON D.C. - CAPITAL CENTRE	WASHINGTON D.C.	4.1	8	WASHINGTON D.C.	3.1	7
13. CLEVELAND - COLISEUM, RICHFIELD OH	CLEVELAND	3.9	9	CLEVELAND	1.9	19
14. DALLAS REUNION ARENA	DALLAS-FORT WORTH	3.8	10	DALLAS-FORT WORTH	3.0	8
15. HOUSTON - SUMMIT	HOUSTON	3.7	11	HOUSTON	2.9	9
16. PITTSBURGH CIVIC ARENA	PITTSBURGH	3.2	12	PITTSBURGH	2.3	13
17. MINNEAPOLIS - MET CENTER	MINNEAPOLIS-ST PAUL	3.1	13	MINNEAPOLIS-ST PAUL	2.1	15
18. ATLANTA - OMNI	ATLANTA	3.1	14	ATLANTA	2.0	16
19. SEATTLE KINGDOME	SEATTLE-TACOMA	3.0	15	SEATTLE-EVERETT	1.6	23
20. ST LOUIS ARENA	ST LOUIS	2.9	17	ST LOUIS	2.4	12
21. DENVER - McNICHOLS SPORTS ARENA	DENVER	2.4	19	DENVER-BOULDER	1.6	22
22. INDIANAPOLIS - MARKET SQUARE ARENA	INDIANAPOLIS	2.2	22	INDIANAPOLIS	1.2	34
23. HARTFORD CIVIC ARENA	HARTFORD	2.2	23	HARTFORD	0.7	54
24. PHOENIX - ARIZ VET MEMORIAL COLISEUM	PHOENIX	2.1	24	PHOENIX	1.5	26
25. PORTLAND COLISEUM (OREGON)	PORTLAND, ORE.	2.1	25	PORTLAND, ORE.	1.2	32
26. SAN DIEGO SPORTS ARENA	SAN DIEGO	2.0	26	SAN DIEGO	1.9	20
27. KANSAS CITY - KEMPER ARENA	KANSAS CITY	1.9	28	KANSAS CITY	1.3	29
28. MILWAUKEE - M.E.C.C.A.	MILWAUKEE	1.9	29	MILWAUKEE	1.4	28
29. BUFFALO MEMORIAL AUDITORIUM	BUFFALO	1.8	32	BUFFALO	1.2	31
30. SALT LAKE CITY - SALT PALACE	SALT LAKE CITY	1.7	33	SALT LAKE CITY-OGDEN	0.9	40
31. PROVIDENCE CIVIC CENTER	PROVIDENCE-NEW BEDFORD	1.5	41	PROVIDENCE-WARWICK-PAWTUCKET	0.9	41
32. SAN ANTONIO - HEMISFAIR ARENA	SAN ANTONIO	1.5	43	SAN ANTONIO	1.1	36
33. SPRINGFIELD CIVIC CENTER	SPRINGFIELD, MA	0.6	95	SPRINGFIELD-CHICOPEE-HOLYOKE	0.5	74

EXHIBIT 1-14

EVENT & ATTENDANCE PROFILE

	EVENTS			ATTENDANCE (000'S)		
CITY - FACILITY	FRANCHISE SPORTS	OTHER	TOTAL	FRANCHISE SPORTS	OTHER	TOTAL
1. ATLANTA - OMNI	41	164	205	293	1,507	1,800
2. BOSTON GARDEN	93	105	198	1,184	964	2,148
3. BUFFALO MEMORIAL AUDITORIUM	71	134	205	786	495	1,281
4. CALGARY - OLYMPIC SADDLE DOME	40 (2)	70	110 (2)	751	na	na
5. CHICAGO STADIUM	100	125	225	1,149	na	na
6. CLEVELAND - COLISEUM, RICHFIELD OH	66	139	205	356	na	na
7. DALLAS REUNION ARENA	42	125	167	424	1,174	1,598
8. DENVER - McNICHOLS SPORTS ARENA	88	77	165	593	735	1,328
9. DETROIT - JOE LOUIS ARENA	na	na	na	519	na	na
10. EDMONTON NORTHLANDS COLISEUM	55	46	101	961	615	1,576
11. HARTFORD CIVIC ARENA	50	127	177	526	1,009	1,535
12. HOUSTON - SUMMIT	42	126	168	304	1,082	1,386
13. INDIANAPOLIS - MARKET SQUARE ARENA	41	109	150	419	na	na
14. KANSAS CITY - KEMPER ARENA	69	73	142	794	na	na
15. LOS ANGELES FORUM	na	na	na	1,205	na	na
16. MILWAUKEE - M.E.C.C.A.	82	101	183	528	566	1,094
17. MINNEAPOLIS - MET CENTER	48	182	230	668	913	1,581
18. MONTREAL - FORUM	45	na	na	664	na	na
19. NASSAU VETERANS MEMORIAL COLISEUM	na	na	na	606	1,194	1,800
20. NEW JERSEY MEADOWLANDS - BYRNE ARENA	87	143	230	902	1,168	2,070
21. NEW YORK - MADISON SQUARE GARDEN	105	375	480	1,164	na	na
22. OAKLAND-ALAMEDA COUNTY COLISEUM	na	na	na	413	na	na
23. PHILADELPHIA - SPECTRUM	92	153	245	1,350	1,472	2,822
24. PHOENIX - ARIZ VET MEMORIAL COLISEUM	41	95	136	466	na	na
25. PITTSBURGH CIVIC ARENA	66	121	187	442	na	na
26. PONTIAC SILVERDOME	71	30	101	962	619	1,581
27. PORTLAND COLISEUM (OREGON)	80	174	254	799	na	na
28. PROVIDENCE CIVIC CENTER	na	136	136	na	778	778
29. QUEBEC - THE COLISEUM	45	88	133	618	613	1,231
30. ST LOUIS ARENA	72	146	218	729	na	na
31. SALT LAKE CITY - SALT PALACE	76	74	150	474	na	na
32. SAN ANTONIO - HEMISFAIR ARENA	52	169	221	425	487	912
33. SAN DIEGO SPORTS ARENA	na	na	na	266	na	na
34. SEATTLE KINGDOME	na	na	na	575	na	na
35. SPRINGFIELD CIVIC CENTER	na	na	na	na	na	na
36. TORONTO MAPLE LEAF GARDEN	42	na	na	656	na	na
37. VANCOUVER - PACIFIC COLISEUM	44	141	185	647	na	na
38. WASHINGTON D.C. - CAPITAL CENTRE	83	147	230	873	na	na
39. WINNEPEG ARENA	na	na	na	516	na	na
40. WORCESTER - CENTRUM	na	187	187	na	na	na

NOTES: na - not available or not applicable
(1) Data is for the most recent full year available.
(2) Opened October 1983.

SOURCES: Data obtained from the individual facilities (by survey or telephone), the NBA, and the NHL.

EXHIBIT 1-15

SUMMARY OF EVENT & ATTENDANCE PROFILE

	EVENTS			ATTENDANCE (000's)		
	FRANCHISE SPORTS	OTHER	TOTAL	FRANCHISE SPORTS	OTHER	TOTAL
HIGH						
NEW YORK - MADISON SQUARE GARDEN	105	375	480			
PHILADELPHIA - SPECTRUM				1,350	1,472	2,822
LOW						
CALGARY - OLYMPIC SADDLE DOME	40					
EDMONTON NORTHLANDS COLISEUM		46	101			
ATLANTA - OMNI				293		
SAN ANTONIO - HEMISFAIR ARENA					487	912
AVERAGE - ALL RESPONDING ARENAS	67	129	196	670	895	1,716

NOTES: (1) SEE EXHIBIT 1-14 FOR DETAIL. DOMED STADIUMS, WORCESTER, PROVIDENCE, AND SPRINGFIELD ARE EXCLUDED FROM AVERAGES.

EXHIBIT 1-16

NBA REGULAR SEASON AVERAGE ATTENDANCE

1983-84 RANKING	TEAM	1983 - 84 AVERAGE ATTENDANCE	1982 - 83 AVERAGE ATTENDANCE
1	DETROIT	15,924	12,733
2	LOS ANGELES	15,180	15,811
3	BOSTON	14,801	15,167
4	PHILADELPHIA	14,345	15,775
5	DALLAS	14,223	11,882
6	PORTLAND	12,666	12,666
7	NEW JERSEY	12,499	12,947
8	NEW YORK	12,100	10,703
9	DENVER	11,278	12,105
10	SEATTLE	10,902	14,024
11	PHOENIX	10,871	11,356
12	HOUSTON	10,631	7,491
13	INDIANA	10,273	4,814
14	MILWAUKEE	10,104	10,380
15	UTAH	9,947	8,679
16	SAN ANTONIO	9,168	9,743
17	KANSAS CITY	9,031	8,301
18	GOLDEN STATE	8,239	8,323
19	WASHINGTON	7,920	8,990
20	ATLANTA	7,139	7,138
21	CHICAGO	6,365	7,343
22	SAN DIEGO	5,578	4,778
23	CLEVELAND	5,075	3,916
	LEAGUE AVERAGE	10,620	10,220

SOURCES: NBA GUIDE, 1983-1984 AND THE DAILY RACING FORM
SURVEY ON SPORTS ATTENDANCE, 1974 THROUGH 1983 EDITIONS

EXHIBIT 1-17

NHL REGULAR SEASON AVERAGE ATTENDANCE

1983-84 RANKING	TEAM	1983 - 84 AVERAGE ATTENDANCE	1982 - 83 AVERAGE ATTENDANCE
1	EDMONTON	17,498	17,498
2	NY RANGERS	17,394	17,490
3	CHICAGO	16,821	17,099
4	CALGARY	16,784	7,242
5	MONTREAL	16,728	16,621
6	DETROIT	16,728	12,994
7	PHILADELPHIA	16,635	16,846
8	TORONTO	16,382	16,396
9	NY ISLANDERS	15,615	15,137
10	QUEBEC	15,137	15,111
11	MINNESOTA	14,355	14,481
12	VANCOUVER	14,239	14,581
13	BUFFALO	14,164	12,894
14	BOSTON	13,588	13,276
15	ST. LOUIS	13,012	12,588
16	WASHINGTON	12,596	12,596
17	WINNIPEG	11,838	12,889
18	HARTFORD	11,506	10,586
19	NEW JERSEY	11,451	12,489
20	LOS ANGELES	10,495	11,546
21	PITTSBURGH	6,872	8,407
	LEAGUE AVERAGE	14,278	13,751

SOURCE: HOCKEY NEWS MAGAZINE

EXHIBIT 1-18

AVERAGE FACILITY UTILIZATION : NBA FACILITIES

HOME FACILITY UTILIZATION RANKING	TEAM	1983 - 84 AVERAGE ATTENDANCE	HOME FACILITY CAPACITY	AVERAGE HOME FACILITY UTILIZATION
1	PORTLAND	12,666	12,666	100%
2	BOSTON	14,801	15,320	97%
3	MILWAUKEE	10,104	11,052	91%
4	LOS ANGELES	15,180	17,505	87%
5	UTAH	9,947	12,143	82%
6	DALLAS	14,223	17,707	80%
7	PHILADELPHIA	14,345	18,482	78%
8	PHOENIX	10,871	14,660	74%
9	DETROIT	15,924	22,366	71%
10	HOUSTON	10,631	15,816	67%
11	DENVER	11,278	17,251	65%
12	NEW JERSEY	12,499	20,149	62%
13	GOLDEN STATE	8,239	13,335	62%
14	NEW YORK	12,100	19,591	62%
15	INDIANA	10,273	17,092	60%
16	SAN ANTONIO	9,168	15,800	58%
17	KANSAS CITY	9,031	16,668	54%
18	ATLANTA	7,139	15,700	45%
19	WASHINGTON	7,920	19,105	41%
20	SAN DIEGO	5,578	13,753	41%
21	CHICAGO	6,365	17,374	37%
22	SEATTLE	10,902	40,192	27%
23	CLEVELAND	5,075	19,548	26%
	LEAGUE AVERAGE	10,260	17,534	64%

SOURCE: NBA GUIDE, 1983-84

EXHIBIT 1-19

AVERAGE FACILITIES UTILIZATION : NHL FACILITIES

HOME FACILITY UTILIZATION RANKING	TEAM	1983 - 84 AVERAGE ATTENDANCE	HOME FACILITY CAPACITY	AVERAGE HOME FACILITY UTILIZATION
1	MONTREAL	16,727	16,074	104%
2	CALGARY	16,784	16,703	100%
3	TORONTO	16,382	16,382	100%
4	EDMONTON	17,498	17,498	100%
5	NY RANGERS	17,394	17,500	99%
6	QUEBEC	15,137	15,264	99%
7	NY ISLANDERS	15,615	15,843	99%
8	CHICAGO	16,821	17,263	97%
9	PHILADELPHIA	16,635	17,159	97%
10	MINNESOTA	14,239	15,753	95%
11	BOSTON	13,588	14,384	94%
12	VANCOUVER	14,355	15,184	90%
13	DETROIT	16,727	19,275	87%
14	BUFFALO	14,164	16,433	86%
15	HARTFORD	11,506	14,800	78%
16	WINNIPEG	11,838	15,250	78%
17	ST. LOUIS	13,012	17,968	72%
18	WASHINGTON	12,596	18,130	69%
19	LOS ANGELES	10,495	16,002	66%
20	NEW JERSEY	11,451	19,023	60%
21	PITTSBURGH	6,872	16,033	43%
	LEAGUE AVERAGE	14,278	16,568	86%

SOURCES: HOCKEY NEWS MAGAZINE AND NHL OFFICIAL GUIDE, 1983-84

EXHIBIT 1-20

EXAMPLES OF EVENTS OTHER THAN FRANCHISED SPORTS

EXAMPLES	CURRENTLY HELD AT BOSTON GARDEN		EXAMPLE OF FACILITY OFFERING THE EVENT
	YES	NO	
LOCAL COLLEGE SPORTS	X		-
LOCAL HIGH SCHOOL SPORTS	X		-
COLLEGE GRADUATIONS	X		-
HIGH SCHOOL GRADUATIONS		X	Capital Centre
SYMPHONY ORCHESTRAS		X	Montreal Forum
CONCERTS	X		-
OPERA		X	Montreal Forum
CONVENTIONS OR RELATED MEETINGS		X	Denver
ART EXHIBITIONS/AUCTIONS		X	Capital Centre
RELIGIOUS GATHERINGS		X	Spectrum
SESAME STREET		X	Meadowlands
ALVIN AND THE CHIPMUNKS		X	Providence
ICE CAPADES	X		-
DISNEY ON ICE	X		-
WORLD CLASS FIGURE SKATING		X	Hartford
NATIONAL ICE SKATING COMPETITIONS		X	Spectrum
TRACK MEETS		X	Reunion Arena
TENNIS TOURNAMENTS		X	Spectrum
HARLEM GLOBETROTTERS	X		-
CIRCUS	X		-
RODEO		X	Worcester
HORSE SHOWS/AUCTIONS		X	Kemper
TRUCK AND TRACTOR PULLS		X	Meadowlands
MOTORCYCLE RACES		X	Edmonton
TOTALS:	8	16	

EXHIBIT 1-21

OPERATING INCOME COMPARISON
(000's)

FACILITY	EVENT REVENUE	EVENT EXPENSE	EVENT CONTRIBUTION	OTHER REVENUE	OVERHEAD EXPENSE (2)	OPERATING INCOME
Boston Garden	$6,412	$3,096	$3,316	$1,096	$2,705	$1,707
# 1	13,775	8,232	5,543	3,579	6,307	2,815
# 2	2,046	1,816	230	114	444	(100)
# 3 (3)	6,775	5,413	1,362	1,440	2,272	530
# 4	na	na	4,264	872	2,658	2,478
# 5	na	na	1,442	762	1,827	377
# 6	na	na	3,090	177	975	2,292
# 7	2,579	1,512	1,067	0	637	430
# 8	6,267	2,972	3,295	880	2,355	1,820

NOTES:

(1) Most recent complete fiscal year available.

(2) Excludes depreciation, interest, and taxes where known or applicable.

(3) Debt service not broken out and may or may not be included in expense breakdown.

EXHIBIT 1-22

LOCATION OF ARENA FACILITIES

45% - WITHIN CENTRAL BUSINESS DISTRICT

44% - WITHIN CITY LIMITS BUT OUTSIDE CENTRAL BUSINESS DISTRICT

- AVERAGE OF 2 MILES FROM CENTRAL BUSINESS DISTRICT
- RANGE - ZERO TO 5 MILES

11% - OUTSIDE CITY LIMITS

- AVERAGE OF 15 FROM CITY
- RANGE - 8 TO 25 MILES

SOURCE: ALL RESPONDING ARENAS

EXHIBIT 1-23

SUMMARY OF ARENA SITE CHARACTERISTICS

62% - COMMERCIAL

45% - NEAR MAJOR ROADWAY INTERCHANGE

31% - RESIDENTIAL

28% - RETAIL

17% - OPEN SPACE

10% - INDUSTRIAL

3% - AGRICULTURIAL

3% - INSTITUTIONAL

SOURCE: ALL RESPONDING ARENAS

EXHIBIT 1-24

SUMMARY OF RELATED STRUCTURES SURROUNDING FACILITIES

MOST ARENAS ARE PART OF A MULTIPLE FACILITY DEVELOPMENT

- 59% OF RESPONDANTS HAD RELATED STRUCTURES SURROUNDING THEIR SITES EXCLUDING PARKING AND HOTELS / RESTAURANTS
- 86% HAD SOME TYPE OF RELATED STRUCTURE BESIDE THE FACILITY INCLUDING PARKING AND HOTELS / RESTAURANTS

TYPES OF RELATED STRUCTURES

79% - DEDICATED PARKING

45% - HOTELS / RESTAURANTS

24% - CONVENTION FACILITIES

21% - EXHIBITION HALLS OR FACILITIES

21% - SPORTS STADIUM

21% - RETAIL SHOPPING

14% - SMALLER AUDITORIUM

14% - STATE FAIRGROUNDS OR AGRICULTURAL

10% - RECREATION AREAS

7% - RACETRACK

3% - OFFICE BUILDING

SOURCE: ALL RESPONDING ARENAS

EXHIBIT 1-25

PARKING SPACES NEAR FACILITY SITE

	AUTOS	BUSES	MAXIMUM FACILITY - RELATED PARKING DISTANCE FROM ARENA
AVERAGE NUMBER OF SPACES (1)	7,800	110	2.6 BLOCKS
HIGHEST NUMBER OF SPACES (1)			
- NEW JERSEY MEADOWLANDS - BYRNE ARENA	26,000	200	ON SITE
LOWEST NUMBER OF SPACES (1) (2)			
- QUEBEC COLISEUM	2,500	40	1 BLOCK

NOTES: (1) BASED ON FACILITIES RESPONDING TO INDUSTRY SURVEY.

(2) PARKING NEAR THE MONTREAL FORUM IS ALSO QUITE LIMITED.

EXHIBIT 1-26

PATRON MODE OF TRAVEL

PRIMARY METHOD: PRIVATE AUTO

AVERAGE	92%
MEDIAN	95%
RANGE	60% - 100%

PUBLIC TRANSIT WAS OVER 10% FOR ONLY 3 RESPONDENTS:

QUEBEC	40%
VANCOUVER	25%
PITTSBURGH	20%

TWO OTHER KEY FACILITIES:

MADISON SQUARE GARDEN:
- BUILT OVER PENNSYLVANIA STATION

MONTREAL FORUM:
- LIMITED DOWNTOWN PARKING
- ADJACENT TO SUBWAY STOPS
- PATRONS "SHUTTLE" FROM PARK & RIDE

SOURCE: ALL RESPONDING ARENAS

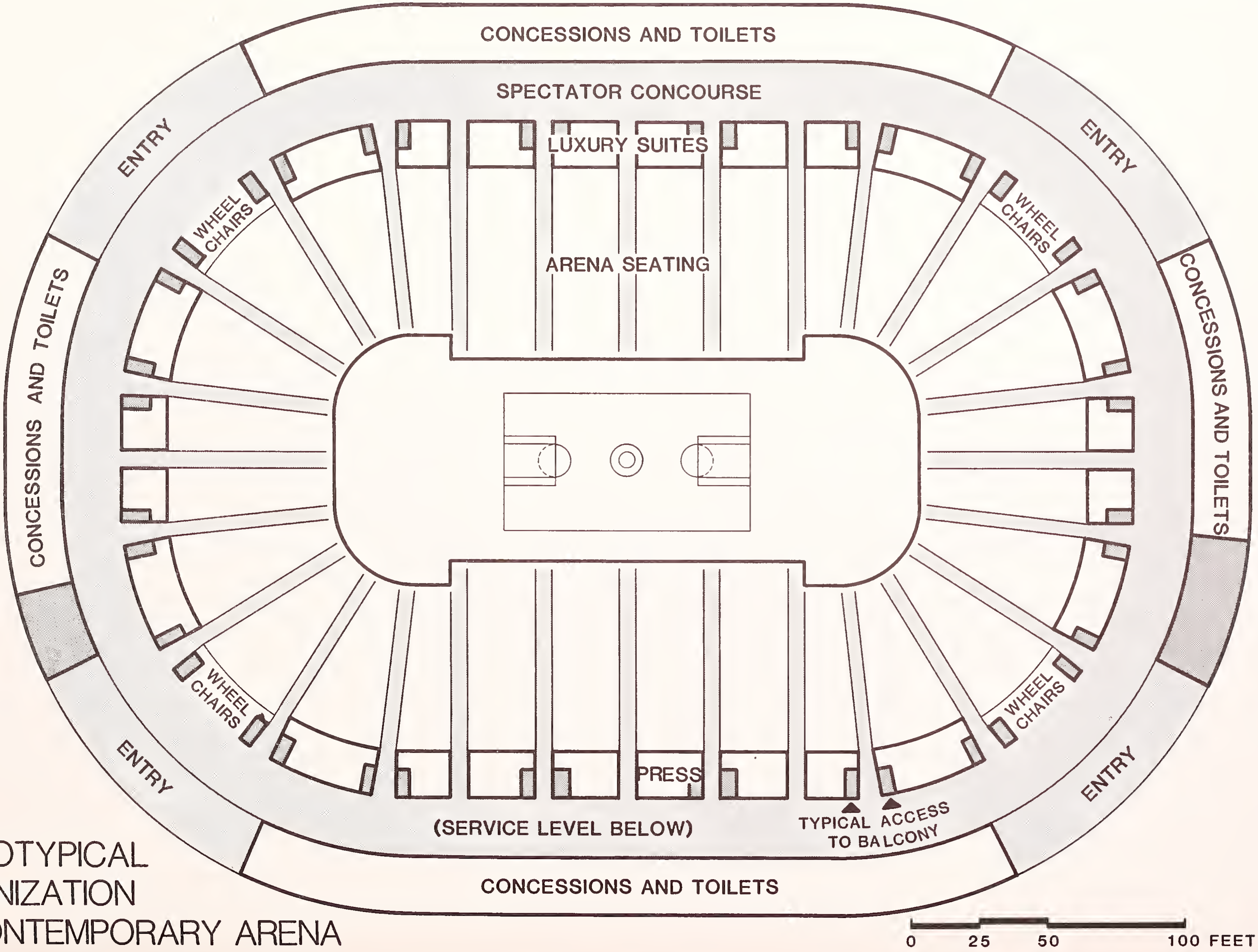
EXHIBIT 1-27

TYPES OF MASS TRANSPOTATION AVAILABLE

RESPONDING FACILITIES SERVE BY SOME TYPE OF MASS TRANSPORTATION	90%
RESPONDING FACILITIES SERVED BY BUS	90%
RESPONDING FACILITIES SERVED BY EITHER SUBWAY OR TROLLEY CAR	26%
RESPONDING FACILITIES SERVED BY TRAIN	10%
RESPONDING FACILITIES SERVED BY BOAT	3%
TOTAL RESPONDENTS SERVED BY SOME TYPE OF RAIL - EITHER SUBWAY, TROLLEY OR TRAIN	29%

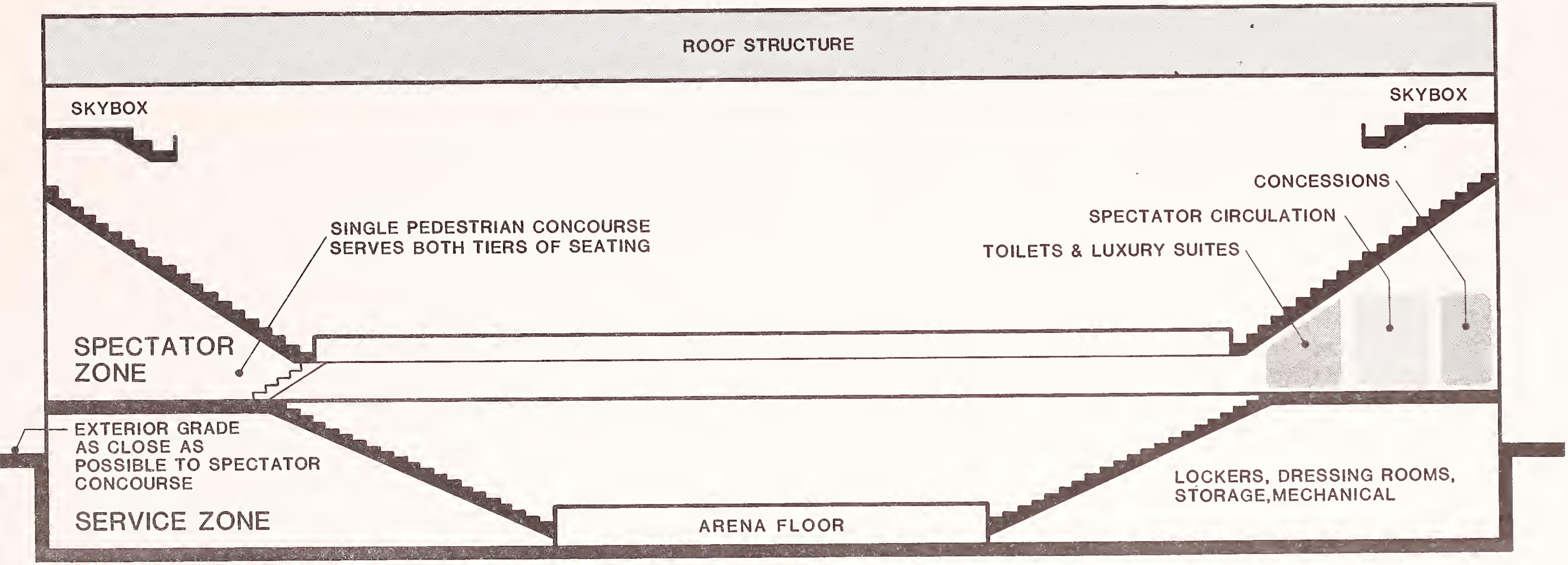
SOURCE: ALL SURVEY RESPONDENTS

EXHIBIT 1–28


CONCESSIONS AND TOILETS
SPECTATOR CONCOURSE
ENTRY
ENTRY
LUXURY SUITES
WHEEL CHAIRS
WHEEL CHAIRS
ARENA SEATING
CONCESSIONS AND TOILETS
CONCESSIONS AND TOILETS
WHEEL CHAIRS
WHEEL CHAIRS
ENTRY
ENTRY
PRESS
(SERVICE LEVEL BELOW)
TYPICAL ACCESS TO BALCONY
CONCESSIONS AND TOILETS
0
25
50
100 FEET

PROTOTYPICAL
ORGANIZATION
OF CONTEMPORARY ARENA

EXHIBIT 1–29


ROOF STRUCTURE
SKYBOX
SKYBOX
CONCESSIONS
SPECTATOR CIRCULATION
TOILETS & LUXURY SUITES
SINGLE PEDESTRIAN CONCOURSE SERVES BOTH TIERS OF SEATING
SPECTATOR ZONE
EXTERIOR GRADE AS CLOSE AS POSSIBLE TO SPECTATOR CONCOURSE
SERVICE ZONE
ARENA FLOOR
LOCKERS, DRESSING ROOMS, STORAGE, MECHANICAL
0
10
30 FEET

TYPICAL CONTEMPORARY ARENA ORGANIZATION

EXHIBIT 2-1

BOSTON ENTERTAINMENT MARKET RANKINGS

	1982 "METROPOLITAN MARKET RANKING"						ARBITRON (ADI)	
	RANK			POPULATION (000)				
CITY	1982	1981	PROJECTED 1987	1982	1981	PROJECTED 1987	RANK 1982	POPULATION 1982 (000)
NEW YORK	1	1	2	8,118	8,153	7,907	1	17,831
LOS ANGELES	2	2	1	7,643	7,558	8,005	2	11,946
CHICAGO	3	3	3	6,029	6,054	5,978	3	8,476
PHILADELPHIA	4	4	4	4,686	4,698	4,713	4	6,976
DETROIT	5	5	5	4,420	4,466	4,371	7	4,690
BOSTON	6	6	6	3,657	3,659	3,647	5	5,352
WASH, D.C.	7	8	8	3,316	3,285	3,465	8	4,116
HOUSTON	8	10	7	3,028	2,891	3,638	11	3,737
NASSAU-SUFFOLK, NY	9	11	9	2,637	2,615	2,680	(1)	(1)
ATLANTA	10	16	10	2,262	2,222	2,502	14	3,085

NOTES: (1) INCLUDED IN NEW YORK

SOURCE: "SALES AND MARKETING MANAGEMENT," 1982 SURVEY OF BUYING POWER, JULY 25, 1983

EXHIBIT 2-2

BOSTON AREA POPULATION SERVED BY RAIL TRANSIT

TRANSIT SYSTEM	CITIES/ TOWNS	POPULATION (2) (000)
GREEN LINE (1)	3	327
ORANGE LINE(1)	3	278
BLUE LINE	2	61
RED LINE (1)	5	430
NORTH/WEST COMMUTER RAIL	22	721
SOUTH/WEST COMMUTER RAIL	9	221
TOTAL	44	2,038

(1) BOSTON DIVIDED:

GREEN:	33%
ORANGE:	33%
RED:	33%

(2) 1980 U.S. CENSUS

EXHIBIT 2-3

BOSTON MASS TRANSIT STATION BOARDINGS

	NORTH STATION (2)	SOUTH STATION (3)
GREEN LINE	4,032	
ORANGE LINE	4,368	
RED LINE		9,030
COMMUTER RAIL	12,200	11,366
	20,600	20,396

(1) ALL BOARDINGS ARE ONE-WAY DAILY.

(2) 1983 MBTA DATA.

(3) RED LINE IS 1978 DATA. COMMUTER RAIL IS 1984 DATA.

EXHIBIT 2-4

MAJOR SOUTHEASTERN NEW ENGLAND ARENA FACILITIES

CITY	MAXIMUM SEATS	1980 (SMSA) POPULATION (000)	MAJOR SPORTS TENANTS	1983 EVENTS MAJOR SPORTS	OTHER (1) SPORTS	FAMILY SHOWS	CONCERTS	OTHER	TOTAL
BOSTON	15,509	2,763	2	93	24	69	2	10	198
WORCESTER (3)	13,000	373	0	14	NA	44	61	68	187
PROVIDENCE	14,000	600	0	2	32	31	33	38	136
HARTFORD	16,269	1,057	1	50 (2)	20	39	34	NA	143
SPRINGFIELD	10,000	522	0	0	57 (4)	NA	NA	NA	NA
NEW HAVEN	11,450	420	1	40	39	41	28	34	182

NOTES: (1) INCLUDES WRESTLING

(2) INCLUDES 4 CELTICS, COMBINATION OF PRE- AND REGULAR SEASON.

(3) 10 MONTHS ENDED 6/83

(4) INCLUDES AMERICAN HOCKEY LEAGUE TEAM (41 EVENTS)

N/A - NOT AVAILABLE (COULD BE INCLUDED IN DIFFERENT EVENT CATEOGRY)

EXHIBIT 2-5

COMPETITIVE FACILITIES' 30 - MILE EQUILIBRIUM BOUNDARIES

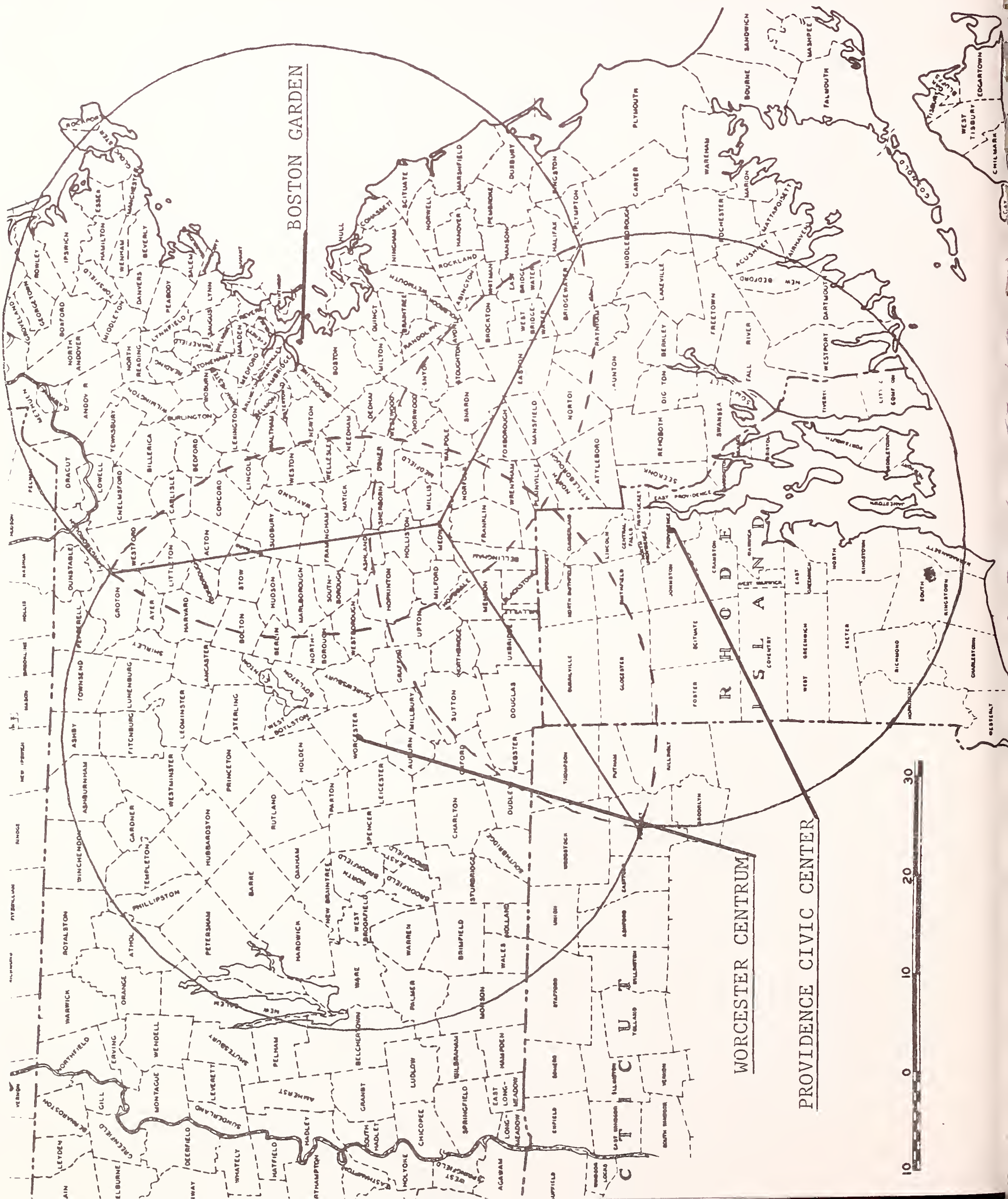

BOSTON GARDEN
WORCESTER CENTRUM
PROVIDENCE CIVIC CENTER
RHODE ISLAND
CONNECTICUT
10
0
10
20
30

EXHIBIT 2-6

POPULATIONS SERVED BY SELECTED ARENAS IN EASTERN NEW ENGLAND

(000's)

	WITHIN 20 MILES	WITHIN 30 MILES
BOSTON GARDEN	2,656	3,189
WORCESTER CENTRUM	643	830
PROVIDENCE CIVIC CENTER	1,101	1,474

SOURCE: 1980 U.S. CENSUS DATA

EXHIBIT 2-7

SAMPLE OF WORCESTER CENTRUM CONCERT TICKET SALES

DISTANCE	PERCENT OF SALES
WITHIN 10 MILES	60.1%
10-20 MILES	6.8%
20-30 MILES	2.0%
30-40 MILES (1)	11.0%
40-50 MILES (1)	10.8%
OVER 50 MILES	9.3%
	100.0%

NOTE: (1) INCLUDES MOST TICKET OUTLETS IN BOSTON PRIMARY MARKET AREA (30 MILE BOUNDRY).

SOURCE: TOTAL TICKET SALES OF NINE EVENTS (1 FAMILY SHOW AND 8 MIXED CONCERTS) CONSIDERED REPRESENTATIVE OF CENTRUM EVENTS BY SPECTACOR MANAGEMENT. ALL DATA SUPPLIED BY SPECTACOR MANAGEMENT.

EXHIBIT 2-8

DISTANCE DISTRIBUTION OF BOSTON CELTICS SEASON TICKET HOLDERS

DISTANCE		TICKET HOLDERS	PERCENT	CUMULATIVE PERCENT
0-5	MILES	1,009	24.7%	24.7%
6-10		762	18.7	43.4
11-20		1,253	30.7	74.1
21-30		570	14.0	88.1
OTHER		484	11.9	100.0%
	TOTAL	4,078	100.0%	

SOURCE: BOSTON CELTICS MANAGEMENT

EXHIBIT 2-9

ARENA FACILIES IN THE BOSTON AREA OVER 2,500 SEATS

FACILITY	SEATS
BOSTON GARDEN	15,500
MATHEWS ARENA (AT NORTHEASTERN)	6,300
HYNES AUDITORIUM	5,200
BOSTON UNIVERSITY WALTER BROWN ARENA	4,200
WANG CENTER	4,200
BOSTON COLLEGE ROBERTS CENTER	4,200
NORTHEASTERN UNIVERSITY PHYSICAL EDUCATION CENTER	3,500
HARVARD UNIVERSITY ARENA	3,400
ORPHEUM THEATRE	2,800

SOURCE: 1983 AUD-ARENA STADIUM GUIDE AND REPRESENTATIVES OF THE INDIVIDUAL ARENAS/THEATRES.

EXHIBIT 2-10

BOSTON GARDEN ANNUAL EVENT MIX TRENDS, 1975 - 1983

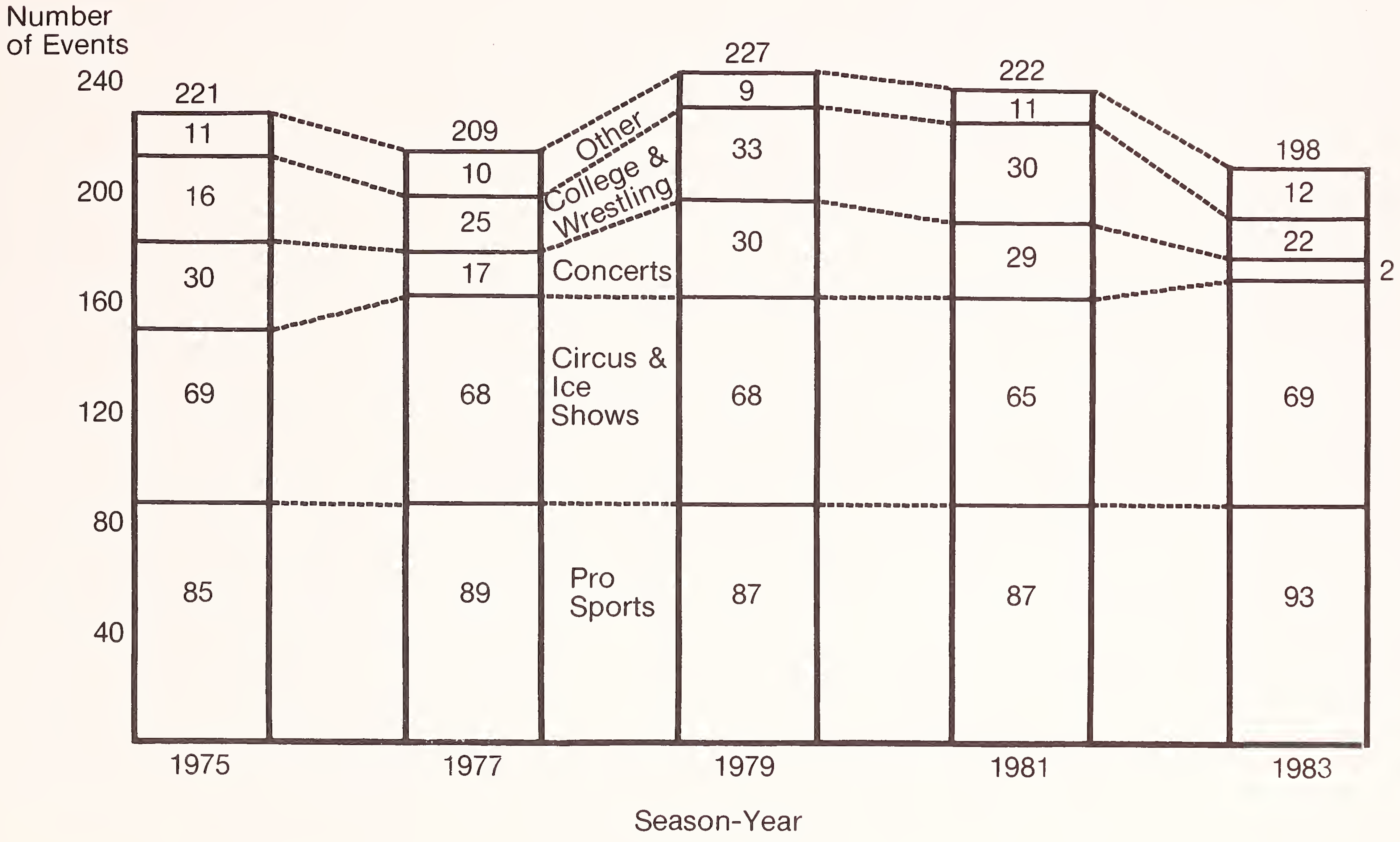


EXHIBIT 2-11

MARKET POTENTIAL FOR A BOSTON ARENA
RANGE OF POTENTIAL EVENTS AND ATTENDANCE

EVENT TYPE	NUMBER OF EVENTS LOW	NUMBER OF EVENTS HIGH	AVERAGE ATTENDANCE	TOTAL ATTENDANCE LOW	TOTAL ATTENDANCE HIGH
BRUINS HOCKEY					
- REGULAR	37	40	13,264	490,768	530,560
- PLAYOFF	0	13	16,580	0	215,540
CELTICS BASKETBALL					
- REGULAR	38	41	15,570	591,660	638,370
- PLAYOFF	0	15	17,300	0	259,500
ICE SHOWS	35	43	6,350	222,250	273,050
CIRCUS	23	27	8,290	190,670	223,830
CONCERTS	25	40	14,359	358,975	574,360
COLLEGE & HIGH SCHOOL	10	20	7,000	70,000	140,000
WRESTLING	8	12	7,500	60,000	90,000
OTHER	9	18	6,000	54,000	108,000
SUBTOTAL "BASELINE"	185	269		2,038,323	3,053,210
ADDITIONAL POTENTIAL					
CONCERTS	5	15	16,600	83,000	249,000
COLLEGE SPORTS	5	10	9,000	45,000	90,000
NATIONAL SPORTS TOURNEY	2	4	17,400	34,800	69,600
LARGE MEETINGS	1	3	10,000	10,000	30,000
HIGH SCHOOL SPORTS	2	8	3,000	6,000	24,000
RELIGIOUS	2	4	8,000	16,000	32,000
OTHER	2	4	5,000	10,000	20,000
SUBTOTAL ADDITIONAL	19	48		204,800	514,600
GRAND TOTAL	204	317		2,243,123	3,567,810

EXHIBIT 2-12

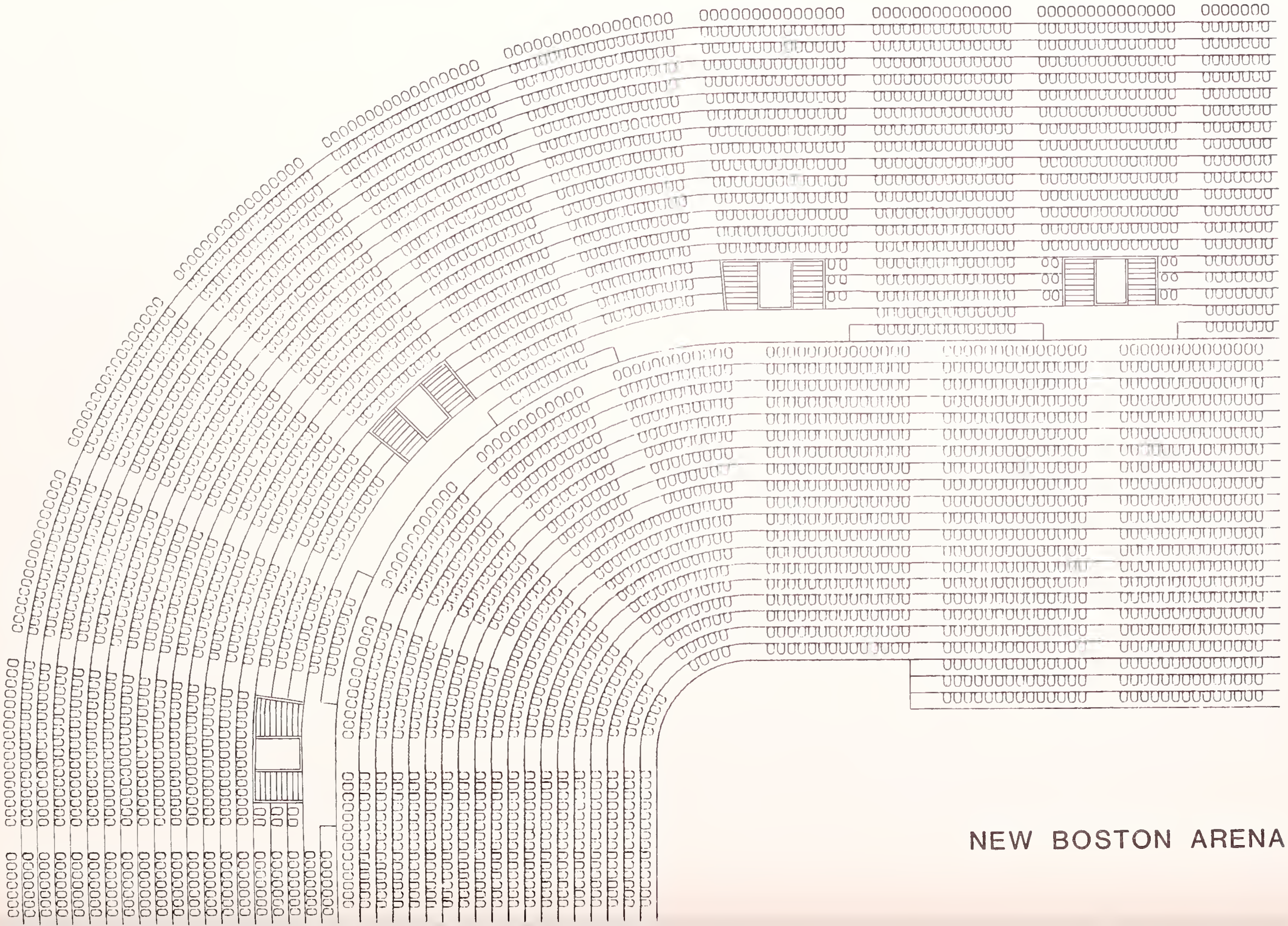
MARKET POTENTIAL FOR A BOSTON ARENA
BASELINE EVENTS / ATTENDANCE ESTIMATE

EVENT TYPE	NUMBER OF EVENTS	EVENT CAPACITY	TOTAL CAPACITY (1)	AVERAGE ATTENDANCE	TOTAL ATTENDANCE	PERCENT OCCUPANCY
BRUINS HOCKEY						
- Regular	40	16,580	663,200	13,264	530,560	80.0%
- Playoff	6	16,580	99,480	16,580	99,480	100.0%
CELTICS BASKETBALL						
- Regular	39	17,300	674,700	16,435	640,965	95.0%
- Playoff	6	17,300	103,800	17,300	103,800	100.0%
FAMILY SHOWS						
- Circus	30	16,580	497,400	8,000	240,000	48.3%
- Ice Capades	30	12,700	381,000	8,000	240,000	63.0%
- Disney on Ice	12	12,700	152,400	8,000	96,000	63.0%
CONCERTS	35	17,300	605,500	15,575	545,125	90.0%
COLLEGE & HIGH SCHOOL	18	17,300	311,400	6,920	124,560	40.0%
OTHER	24	17,300	415,200	7,930	190,320	45.8%
TOTAL	240		3,904,080		2,810,810	72.0%

NOTES: (1) Per event capacity multiplied by number of events.

EXHIBIT 3-1

CADD ANALYSIS OF SEATING CAPACITY



NEW BOSTON ARENA

EXHIBIT 3-2

SPACE LISTING : NEW BUILDING PROGRAM - EXISTING BOSTON GARDEN

	Program for A New Arena	Existing Boston Garden (1)
A) ARENA ACTIVITY AREAS	17,500 S.F.	16,300 S.F.
B) SEATING	100,134 S.F.	77,504 S.F.
C) SPECTATOR AMENITIES	16,530 S.F.	13,016 S.F.
D) CONCOURSE AND VERTICAL CIRCULATION	115,460 S.F.	104,150 S.F.
E) CONCESSIONS	8,680 S.F.	4,194 S.F.
F) BOX OFFICE	5,290 S.F.	7,016 S.F.
G) MEDIA SYSTEMS	2,480 S.F.	500 S.F. (2)
H) ADMINISTRATIVE OFFICES	6,270 S.F.	2,250 S.F. (2)
I) SECURITY	1,080 S.F.	200 S.F. (2)
J) PRESS AND MEDIA FACILITIES	4,700 S.F.	2,448 S.F.
K) MAJOR TENANT OFFICES	6,700 S.F.	2,000 S.F.
L) LOCKER AND DRESSING ROOMS	11,450 S.F.	7,994 S.F.
M) CONCESSION SUPPORT AREAS	9,700 S.F.	5,000 S.F. (2)
N) STAFF SUPPORT AREAS	1,400 S.F.	3,000 S.F. (2)
O) BUILDING MAINTENANCE AREAS	3,150 S.F.	3,000 S.F. (2)
P) STORAGE AND SERVICE AREAS	52,700 S.F.	46,000 S.F. (2)(3)
Q) ICE FACILITIES	2,500 S.F.	2,000 S.F.
R) BUILDING SYSTEMS	15,000 S.F.	20,000 S.F. (2)
TOTAL	364,990 S.F.	317,710 S.F.

NOTES:

(1) Exclusive of B&M Railroad space
(2) Estimate
(3) From New Boston Garden Corporation's Renovation Proposal, pp. 37
Approximately 40,000 S.F. is contained in Anelex building.

EXHIBIT 3-3

COMPARISON : NEW BUILDING PROGRAM - EXISTING BOSTON GARDEN

	Current Program for A New Arena	Existing Boston Garden
SEATING CAPACITIES		
Hockey	16,583	14,458
Basketball	17,311	15,322(1)
Boxing and Center Stage Concerts	18,151	17,168
COMPARATIVE AREA OF SELECTED FUNCTIONS PER SPECTATOR (2)		
B) Seating	5.8 SF/spectator	5.1 SF/spectator
C) Spectator Amenities	.95	.8
D) Concourse and Vertical Circulation	6.7	6.8
E) Concessions	.5	.3
L) Locker and Dressing Rooms	.7	.5
M) Concession Support Areas	.6	.3
SUMMARY COMPARISON GROSS S.F./SPECTATOR		
Hockey	22.0 SF/spectator	22.0/spectator
Basketball	21.1 SF/spectator	20.5/spetator

(1) Source: Boston Celtics; this figure includes 432 skybox seats
(2) Based on basketball seating capacity

EXHIBIT 4-1

BOSTON GARDEN 1981 SCHEDULE OF EVENTS

Week Ending Sunday	10/1/80 - 3/29/81						
	M	T	W	T	F	S	S
10/5/80	X	X		8		8	5
10/12/80	5	5		1	2	5	1
10/19/80			3	3+	3+	3*	3+
10/26/80		3	3+	3+	3+	3*	3*
11/2/80	3+			1	2	5	
11/9/80			2	1	2	8	1
11/16/80	5	5	2	1	2	5	1
11/23/80	5	5		1	2		1
11/30/80	8		2	1	2	1	5
12/7/80	5	1	2		2	8+	81
12/14/80		2		1	2	18	71
12/21/80	5	5	2	1	2	1	
12/28/80		2			4	4*	4+
1/4/81	4+	4+	4+		4+	4*	4+
1/11/81	6		2	1	2	8	6
1/18/81	1		2		2	18	2
1/25/81	1		2	1	2	1	2
2/1/81	1		2	1	6	6	1
2/8/81	6			1	2	8	21
2/15/81	6	4	4	4+	4	4*	
2/22/81	4+	4	4+	4+	4+	4+	4+
3/1/81			2	1	8	5	21
3/8/81	6	6	6	6	6	16	21
3/15/81	7	7	2	5	6	86	21
3/22/81	7		2		2	1	8
3/29/81	1			1	2	1	2

Week Ending Sunday	3/30/81 - 9/30/81						
	M	T	W	T	F	S	S
4/5/81				1		8	2>1
4/12/81		2>	1>	1>			
4/19/81							
4/26/81		2>	2>	5			
5/3/81			2>			8	2>
5/10/81		2>		2>			
5/17/81		2>					
5/24/81						5	
5/31/81						8	
6/7/81							
6/14/81						8	
6/21/81							8
6/28/81				8			
7/5/81							
7/12/81						8	
7/19/81	5		5				
7/26/81					5	5	
8/2/81							
8/9/81					5	8	
8/16/81					5		
8/23/81							
8/30/81							
9/6/81							8
9/13/81	5		5				
9/20/81							5
9/27/81						5	5
10/4/81				X	X	X	X

KEY:

< Pre-season	+ 2 events
> Post-season	* 3 events

1 - Bruins (42)	5 - Concerts (29)
2 - Celtics (45)	6 - College Sports (14)
3 - Circus (25)	7 - High School Sports (4)
4 - Ice Shows (40)	8 - Other Events (23)

Total Events = 222

EXHIBIT 4-2

ANALYSIS OF SUMMER EVENTS

	NUMBER OF EVENTS BY MONTH					
	MAY	JUNE	JULY	AUGUST	SEPTEMBER	TOTAL
SELECTED FACILITIES SERVING MAJOR MARKETS						
Spectrum - 1984	4	28	6	6	7	51
Meadowlands - 1983	12	12	3	12	15	54
Madison Square Garden	31	19	3	5	18	76
SELECTED FACILITIES SERVING SMALLER MARKETS						
Centrum - 1983-4	7	4	3	7	6	27
Providence - 1983-4	7	5	2	4	5	23
BOSTON GARDEN						
Recent "High" Year - 1981	8	3	5	3	6	25
Recent "Low" Year - 1983	2	3	4	1	1	11

EXHIBIT 4-3

HISTORICAL BOSTON GARDEN FINANCIAL RESULTS

	1979	1980	1981	1982	1983
Total Event Revenues	$4,977,925	$5,290,092	$5,956,381	$6,338,999	$5,602,327
Less Event Costs	2,845,240	2,927,750	3,622,386	3,618,378	3,096,202
Net Event Profit	$2,132,685	$2,362,342	$2,333,995	$2,720,621	$2,506,125
Other Revenues					
Concession, advertising, programs	$645,432	$980,255	$1,005,752	$1,099,351	$1,259,506
Sky-box revenue	131,670	122,786	148,296	151,694	163,850
Clubs	85,000	149,827	134,225	136,144	146,430
Other	387,897	389,861	410,423	438,192	329,196
Total Operating Income	$3,382,684	$4,005,071	$4,032,691	$4,546,002	$4,405,107
Operating Expenses					
Direct Building Expenses	$1,048,750	$1,250,346	$1,471,563	$1,598,595	$1,815,497
General & Administration Expenses	1,616,553	1,575,069	1,592,836	1,650,607	1,295,091
Total Operating Expenses	$2,665,303	$2,825,415	$3,064,399	$3,249,202	$3,110,588
Operating Profit or Loss	$717,381	$1,179,656	$968,292	$1,296,800	$1,294,519
Non-Operating Income (Expense)					
Interest	($711,442)	($719,264)	($654,823)	($528,521)	($511,639)
Other	1,814	1,657	2,054	9,804	7,190
Net Profit(Loss) Before Depreciation	$7,753	$462,049	$315,523	$778,083	$790,070
Depreciation	$543,308	$528,622	$508,518	$466,204	$452,701
NET PROFIT (LOSS) BEFORE TAXES	($535,555)	($66,573)	($192,995)	$311,879	$337,369

Source: As reported by New Boston Garden Corp.; stated on an event year basis (ended June 30).

EXHIBIT 4-4

1983 BOSTON GARDEN FINANCIAL RESULTS RESTATED FOR CONVENTIONAL INDUSTRY CONTRACTUAL RELATIONSHIPS
(Dollars in Thousands)

	Using 1983 Events/Attendance		
	Garden Reported (1)	Garden Reformatted (2)	Restated w/Industry Normal(3) Agreements
Number of Events	198	198	198
Attendance (000's)	2,149	2,149	2,149
EVENT REVENUES			
Rent / Admission	$5,602	$4,102	$5,440
Concession	1,260	838	1,934
Expense Reimbursement	0	1,472	1,277
Total Event Revenue	$6,862	$6,412	$8,651
EVENT EXPENSES			
Payroll Related	na	$1,894	$1,894
Outside Security	na	280	280
Maintenance	na	370	370
Licensee Participation			
- Concession	na	0	452
- Other	na	0	915
Other	na	552	552
Total Expense	$3,096	$3,096	$4,463
NET EVENT REVENUE	$3,766	$3,316	$4,188
General & Administrative	$1,294	$1,294	$1,294
Direct Building	1,816	1,816	1,816
Depreciation	453	453	453
Interest	512	512	512
OTHER INCOME	646	1,096	1,096
NET ARENA REVENUE	$337	$337	$1,209

NOTES:

(1) See Exhibit 41, Historical Boston Garden Financial Statements.

(2) Estimated breakdown of Event Revenues and Event Expenses based on normal industry revenue and expense reporting practices. Advertising and Program Revenue estimated at $450,000 was transferred to Other Income.

(3) Restatement assumes "arms-length" agreements between building operator, concessionaire and tenants.

na - not available

EXHIBIT 4-5

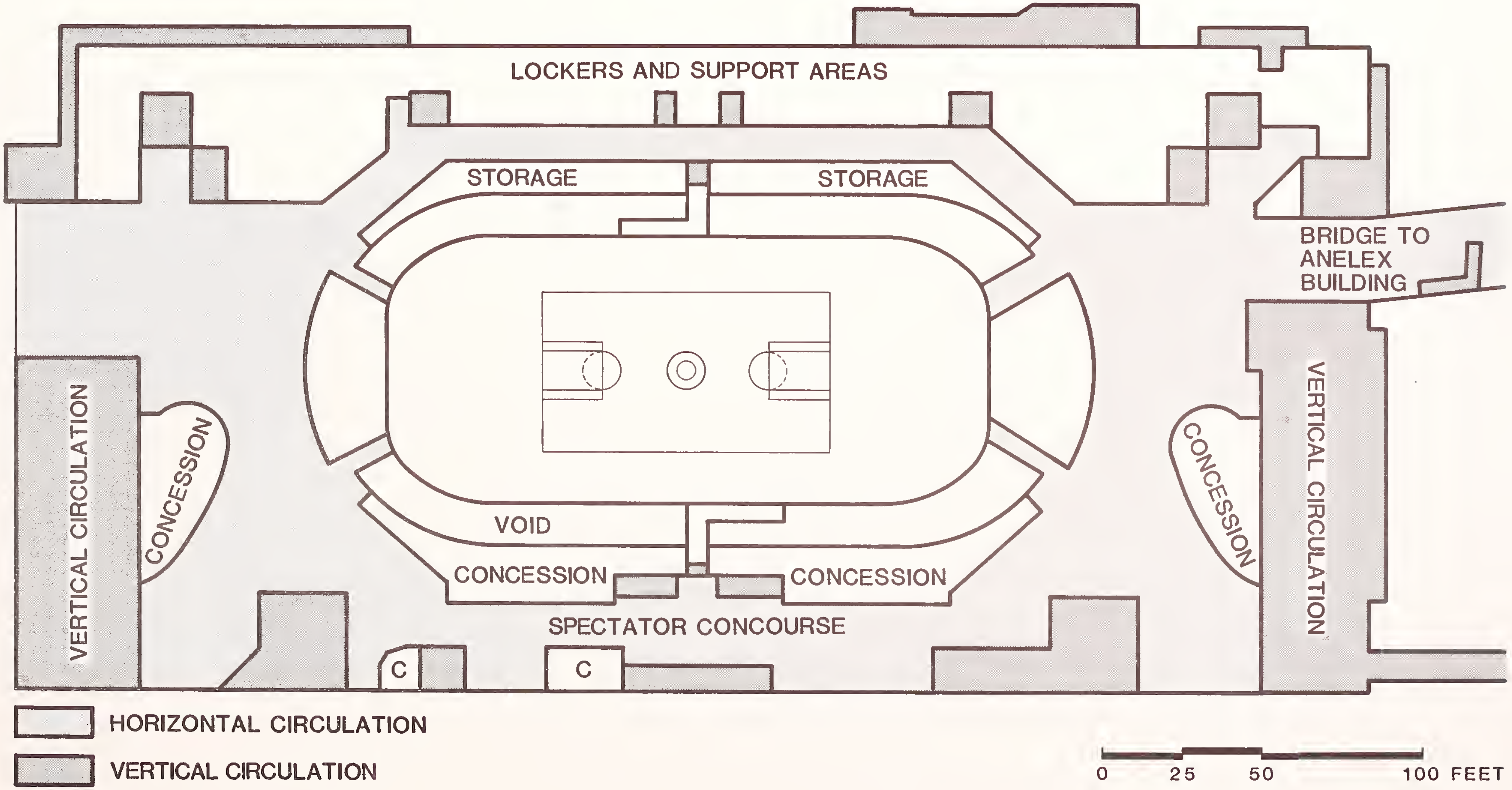
SUMMARY OF ESTIMATED ANNUAL ECONOMIC IMPACT OF THE CURRENT BOSTON GARDEN

Economic Impact Component	1984 Annual Amount (1) (2)
Total Attendees	2,160,000
Patron Spending - Primarily Concessions and Parking	$22,950,000
Salaries and Wages from Garden Operations	$ 8,330,000
Full-Time Employment (Person-Years)	140-170
Estimated Annual Tax Revenues Generated:	
. State Sales and Income Taxes	$ 1,560,000
. City Real Estate Taxes	$ 400,000

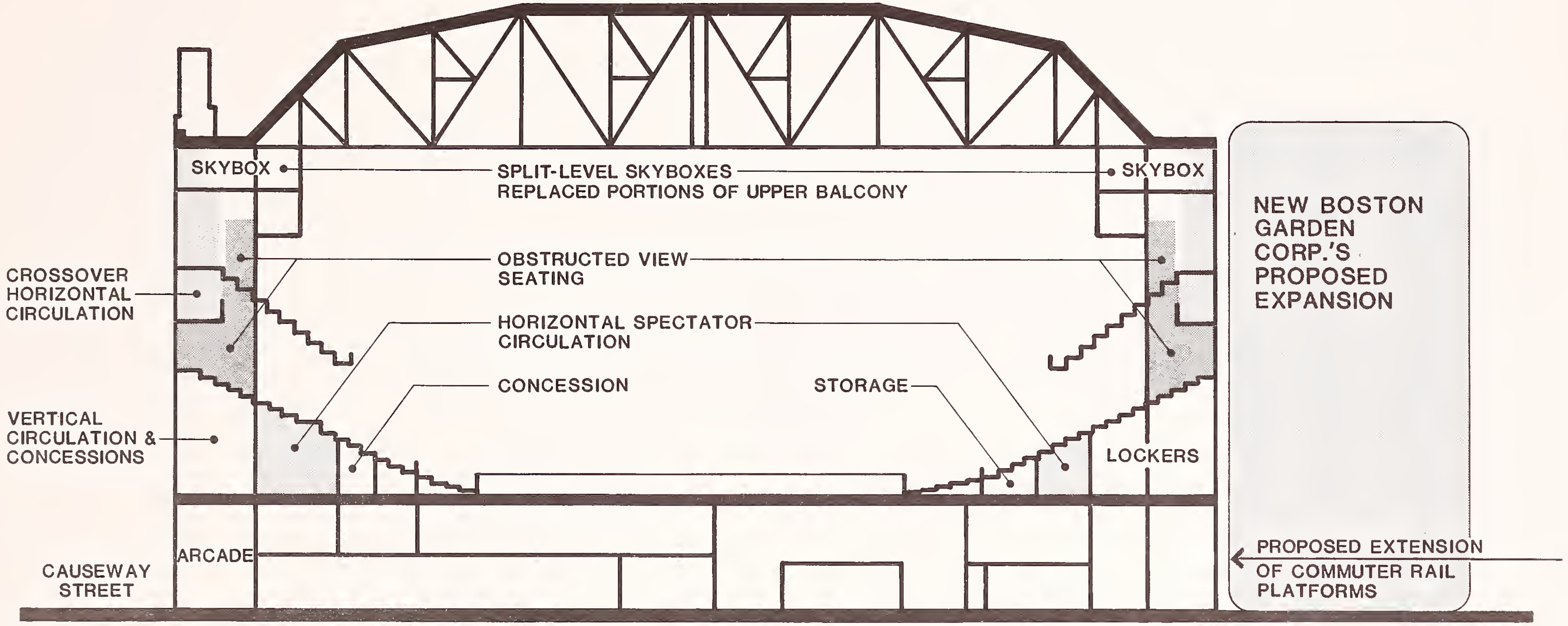
NOTES: (1) A more detailed explanation and derivation of current Boston Garden economic impact is presented in Chapter 14.

(2) All dollar amounts include state multiplier factor of 1.7.

EXHIBIT 4-6

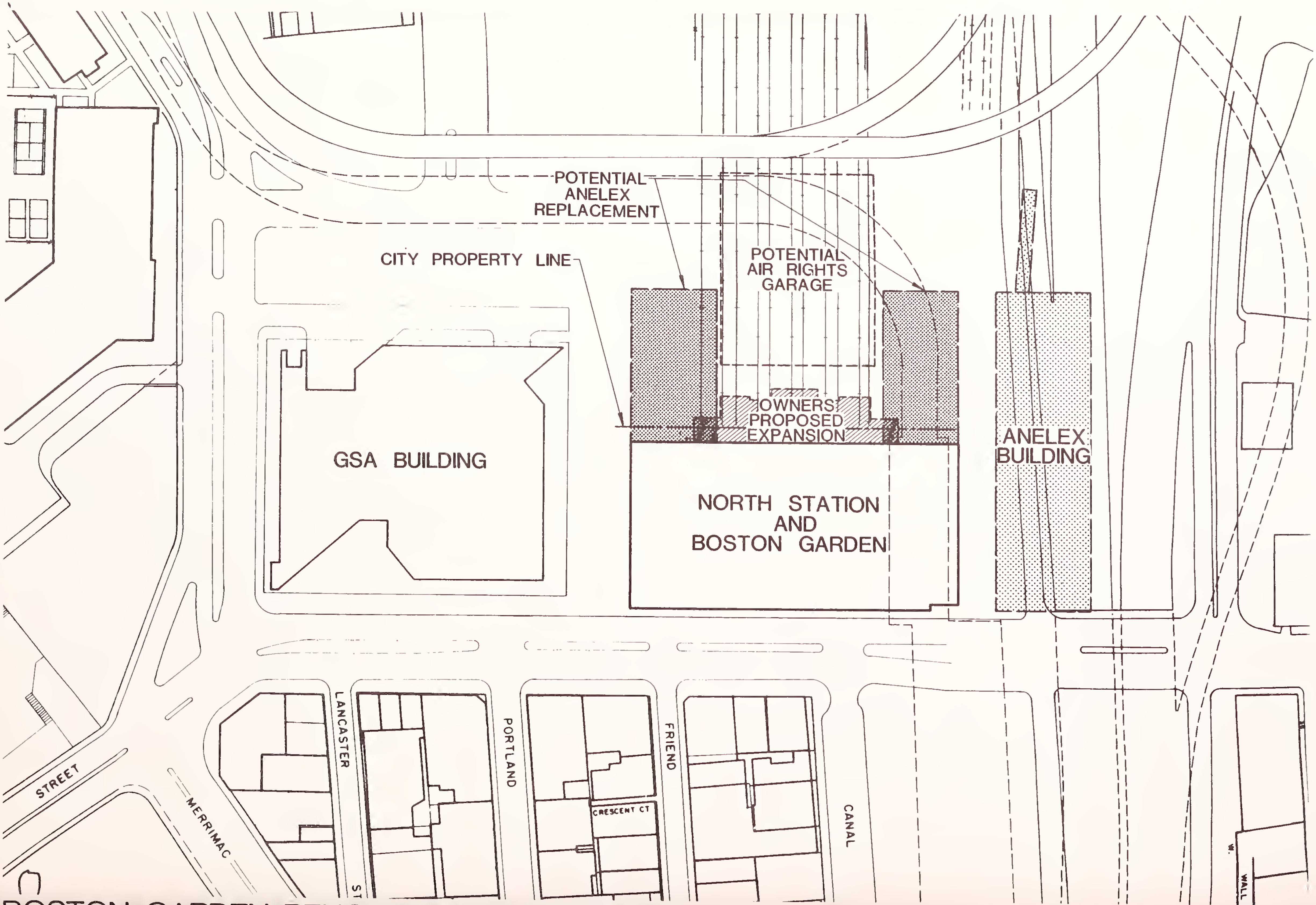

LOCKERS AND SUPPORT AREAS
STORAGE
STORAGE
BRIDGE TO ANELEX BUILDING
VERTICAL CIRCULATION
CONCESSION
VERTICAL CIRCULATION
CONCESSION
VOID
CONCESSION
CONCESSION
SPECTATOR CONCOURSE
C
C
HORIZONTAL CIRCULATION
VERTICAL CIRCULATION
0
25
50
100 FEET

BOSTON GARDEN
PLAN ORGANIZATION - ARENA LEVEL


SKYBOX
SPLIT-LEVEL SKYBOXES REPLACED PORTIONS OF UPPER BALCONY
SKYBOX
NEW BOSTON GARDEN CORP.'S PROPOSED EXPANSION
CROSSOVER HORIZONTAL CIRCULATION
OBSTRUCTED VIEW SEATING
HORIZONTAL SPECTATOR CIRCULATION
CONCESSION
STORAGE
VERTICAL CIRCULATION & CONCESSIONS
LOCKERS
ARCADE
CAUSEWAY STREET
PROPOSED EXTENSION OF COMMUTER RAIL PLATFORMS
0
10
30 FEET

BOSTON GARDEN - SECTION ORGANIZATION
(VIEW TO WEST)

EXHIBIT 4-8


POTENTIAL ANELEX REPLACEMENT
CITY PROPERTY LINE
POTENTIAL AIR RIGHTS GARAGE
OWNERS' PROPOSED EXPANSION
ANELEX BUILDING
GSA BUILDING
NORTH STATION AND BOSTON GARDEN
LANCASTER ST
PORTLAND
FRIEND
CRESCENT CT
CANAL
W. WALL
STREET
MERRIMAC

BOSTON GARDEN RENOVATION SCENARIOS

EXHIBIT 4-9

IMPACT ON BOSTON GARDEN 1983 FINANCIAL RESULTS ARISING FROM POTENTIAL EVENT AND ATTENDANCE INCREASES POSSIBLE UNDER A RENOVATION PROGRAM

(Dollars in Thousands)

	Using 1983 Events/Attendance			With Increased Events	
	Garden Reported (1)	Garden Reformatted (2)	Restated w/Industry Normal(3) Agreements	Garden Reformatted (2)	Restated w/Industry Normal(3) Agreements
Number of Events	198	198	198	232	232
Attendance (000's)	2,149	2,149	2,149	2,683	2,683
EVENT REVENUES					
Rent / Admission	$5,602	$4,102	$5,440	$5,156	$6,844
Concession	1,260	838	1,934	1,046	2,415
Expense Reimbursement	0	1,472	1,277	1,896	1,831
Total Event Revenue	$6,862	$6,412	$8,651	$8,098	$11,090
EVENT EXPENSES					
Payroll Related	na	$1,894	$1,894	$2,419	$2,419
Outside Security	na	280	280	398	398
Maintenance	na	370	370	404	404
Licensee Participation					
- Concession	na	0	452	0	472
- Other	na	0	915	0	1,105
Other	na	552	552	723	723
Total Expense	$3,096	$3,096	$4,463	$3,944	$5,521
NET EVENT REVENUE	$3,766	$3,316	$4,188	$4,154	$5,569
General & Administrative	$1,294	$1,294	$1,294	$1,294	$1,294
Direct Building	1,816	1,816	1,816	1,816	1,816
Depreciation	453	453	453	453	453
Interest	512	512	512	512	512
OTHER INCOME	646	1,096	1,096	1,096	1,096
NET ARENA REVENUE	$337	$337	$1,209	$1,175	$2,590

NOTES:

(1) See Exhibit 41, Historical Boston Garden Financial Statements.

(2) Estimated breakdown of Event Revenues and Event Expenses based on normal industry revenue and expense reporting practices. Advertising and Program Revenue estimated at $450,000 was transferred to Other Income.

(3) Restatement assumes "arms-length" agreements between building operator, concessionaire and tenants.

na - not available

EXHIBIT 4-10

BOSTON GARDEN
RENOVATION FINANCING REQUIREMENTS
(000's)

	FIRST YEAR PAYMENT (1)				INTEREST +
AMOUNT FINANCED	TOTAL	PRINCIPAL	INTEREST	DEPRECIATION (2)	DEPRECIATION (3)
$ 6 MILLION	$ 906	$ 66	$ 840	$300	$1,140
8 MILLION	1,208	88	1,120	400	1,520
10 MILLION	1,510	110	1,400	500	1,900
12 MILLION	1,812	132	1,680	600	2,280
14 MILLION	2,114	154	1,960	700	2,660
16 MILLION	2,416	176	2,240	800	3,040

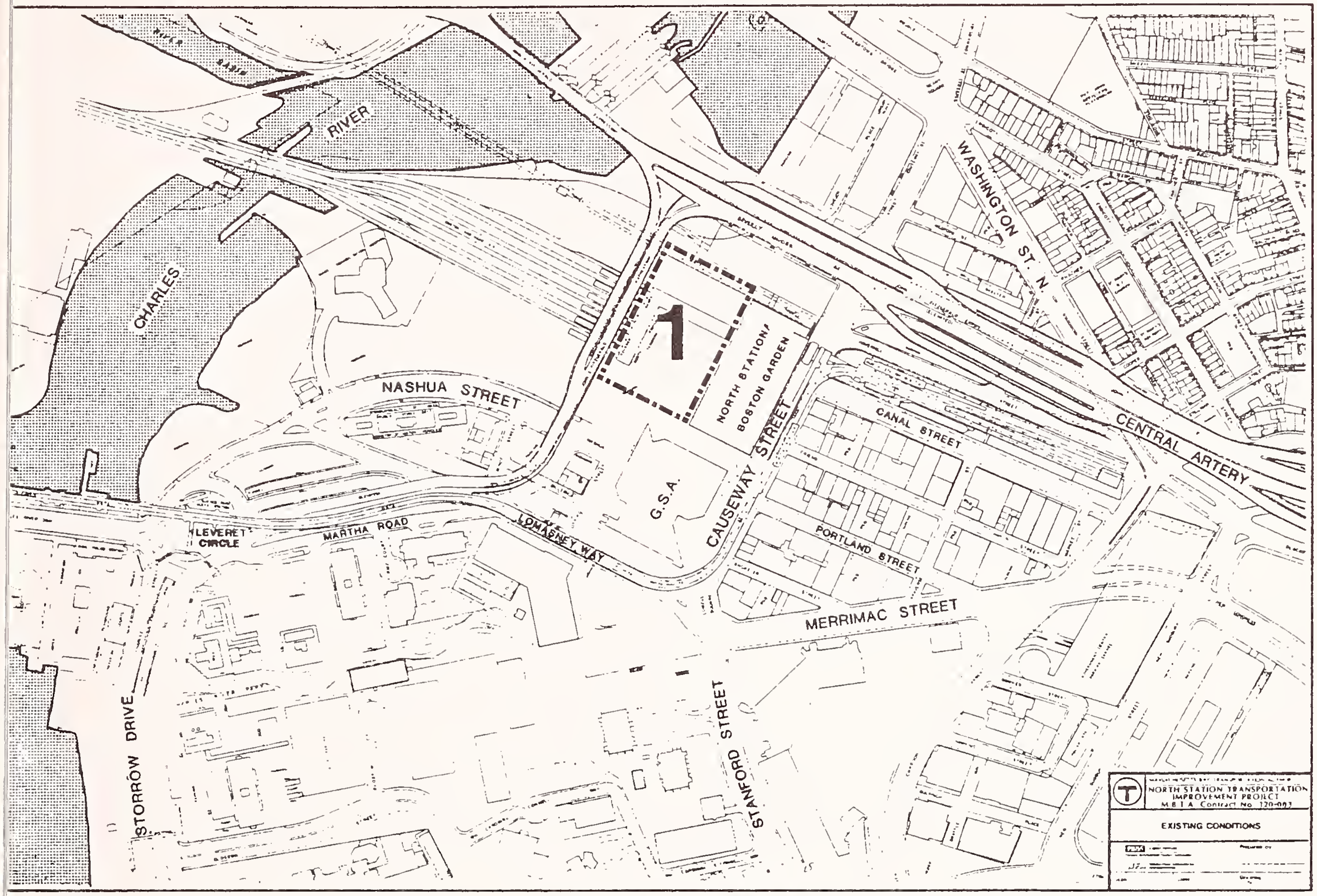
NOTES: (1) LEVEL DEBT SERVICE FOR 20 YEARS AT 14%.

(2) STRAIGHT-LINE BASIS FOR 20 YEARS.

(3) ESTIMATED CURRENT BOSTON GARDEN EARNINGS POTENTIAL WITH ADDITIONAL EVENTS UNDER A RENOVATION PROGRAM:

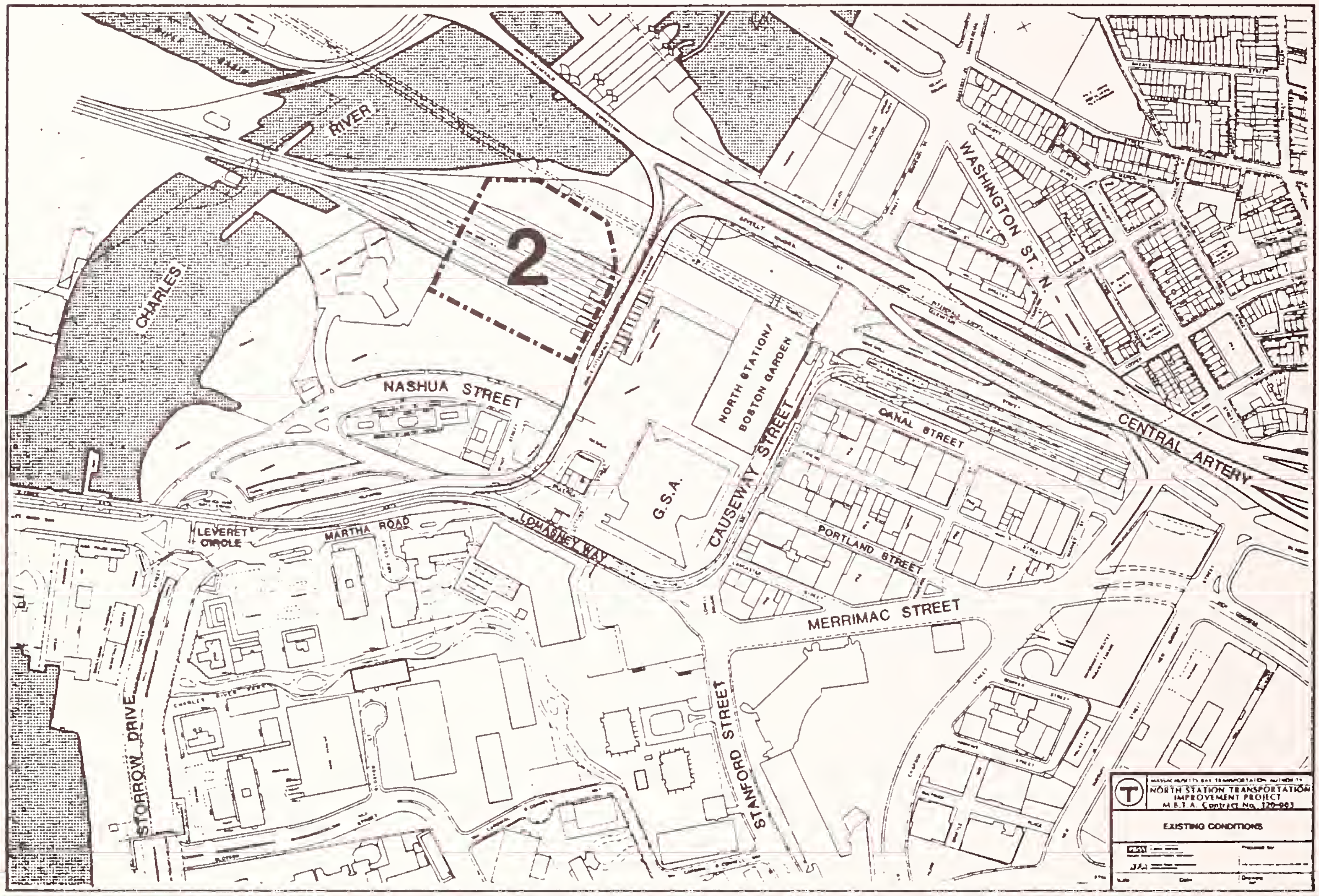
- WITHOUT CONTRACTUAL ADJUSTMENT	$1,175,000.
- WITH CONTRACTUAL ADJUSTMENT	$2,590,000.

EXHIBIT 5-1


CHARLES
RIVER
NASHUA STREET
1
NORTH STATION/
BOSTON GARDEN
WASHINGTON ST. N.
CANAL STREET
CENTRAL ARTERY
G.S.A.
CAUSEWAY STREET
PORTLAND STREET
LEVERETT CIRCLE
MARTHA ROAD
LOMASNEY WAY
MERRIMAC STREET
STORROW DRIVE
STANFORD STREET
NORTH STATION TRANSPORTATION
IMPROVEMENT PROJECT
M.B.T.A. Contract No. 120-093
EXISTING CONDITIONS
Prepared by

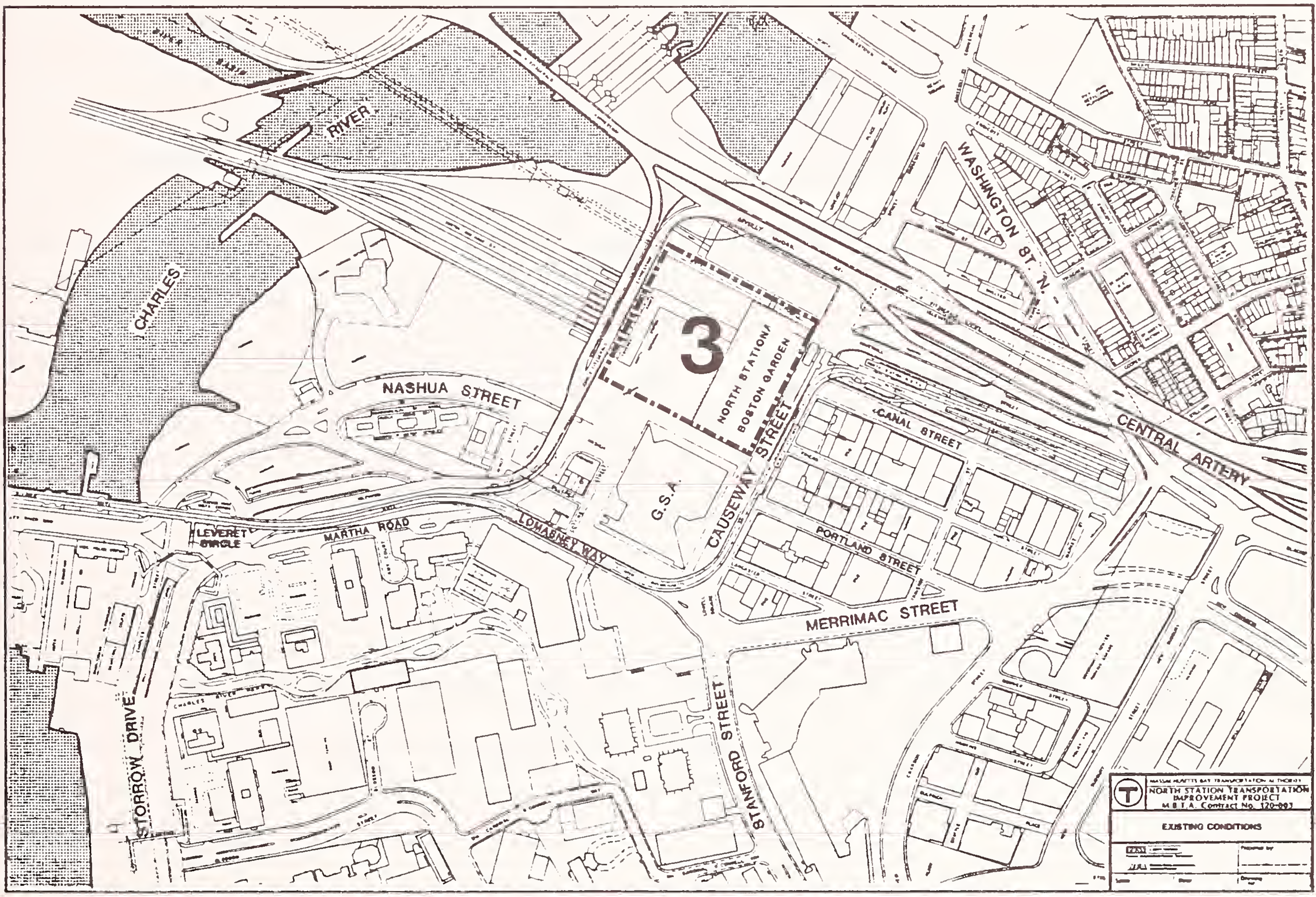
NORTH STATION AREA: NORTH OF GARDEN SITE

EXHIBIT 5-2


2
CHARLES
RIVER
NASHUA STREET
NORTH STATION/ BOSTON GARDEN
WASHINGTON ST. N.
CENTRAL ARTERY
CANAL STREET
CAUSEWAY STREET
G.S.A.
LOMASNEY WAY
PORTLAND STREET
MARTHA ROAD
LEVERETT CIRCLE
MERRIMAC STREET
STANFORD STREET
STORROW DRIVE
NORTH STATION TRANSPORTATION IMPROVEMENT PROJECT
M.B.T.A. Contract No. 120-903
EXISTING CONDITIONS
Prepared by

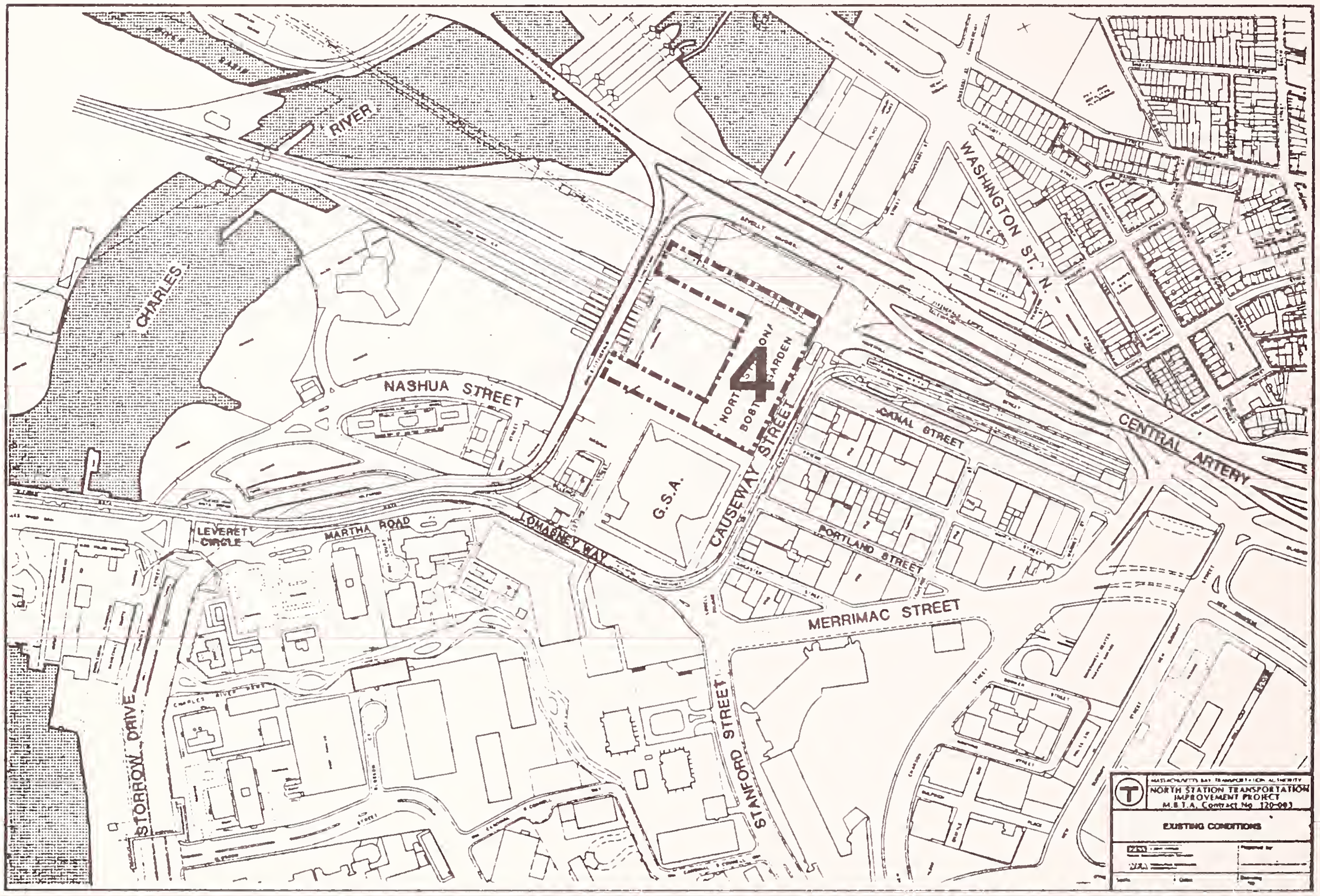
NORTH STATION AREA: NORTH OF RAMPS SITE

EXHIBIT 5-3


CHARLES
RIVER
NASHUA STREET
3
NORTH STATION/
BOSTON GARDEN
G.S.A.
CAUSEWAY STREET
CANAL STREET
WASHINGTON ST. N.
CENTRAL ARTERY
PORTLAND STREET
MERRIMAC STREET
LEVERET CIRCLE
MARTHA ROAD
LOMASNEY WAY
STANFORD STREET
STORROW DRIVE
NORTH STATION TRANSPORTATION IMPROVEMENT PROJECT
M.B.T.A. Contract No. 120-093
EXISTING CONDITIONS

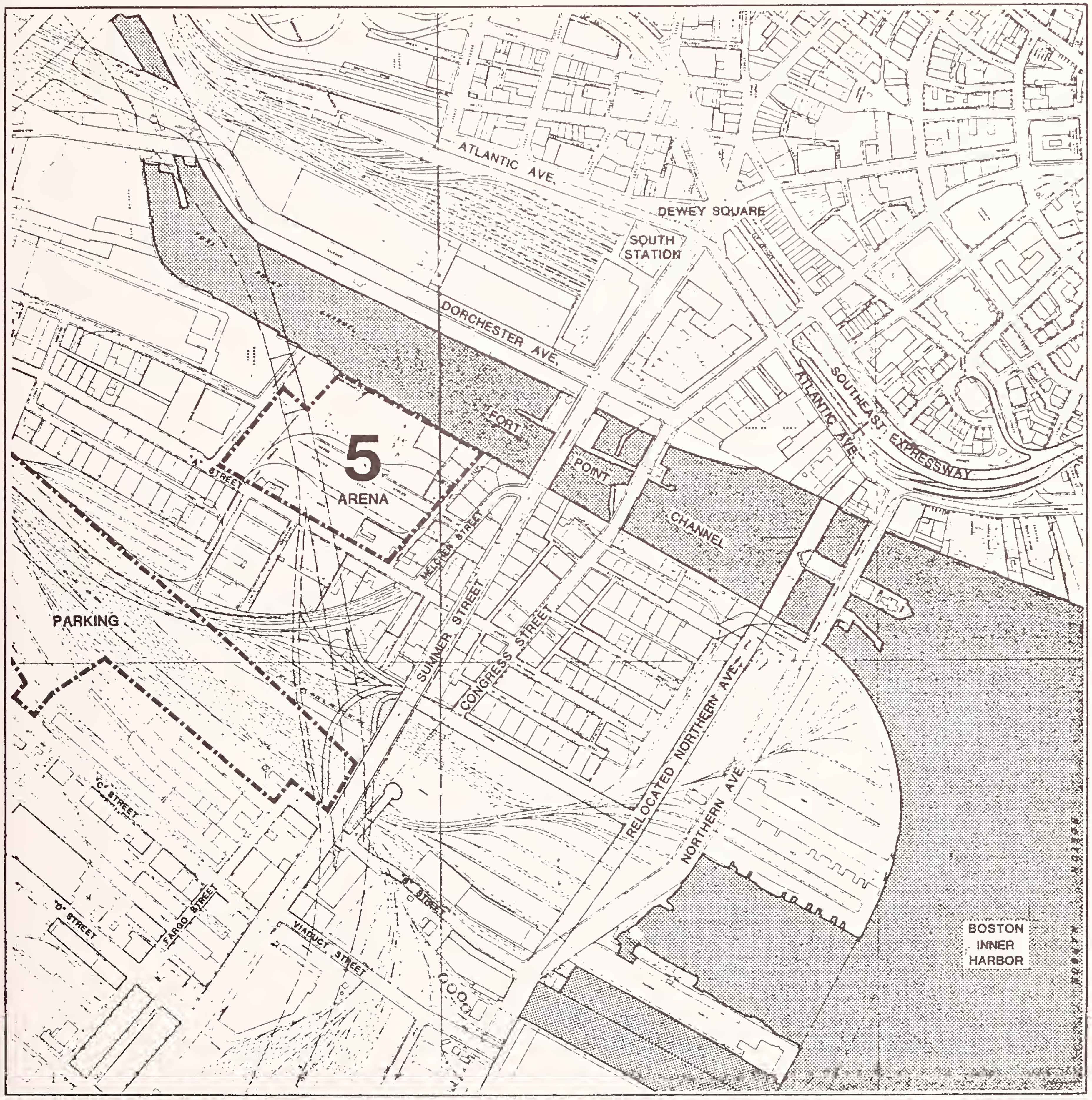
NORTH STATION AREA: REPLACEMENT OF GARDEN SITE

EXHIBIT 5-4


CHARLES
RIVER
NASHUA STREET
4
NORTH STATION
BOSTON GARDEN
G.S.A.
CAUSEWAY STREET
CANAL STREET
PORTLAND STREET
MERRIMAC STREET
STANFORD STREET
WASHINGTON ST. N.
CENTRAL ARTERY
LEVERETT CIRCLE
MARTHA ROAD
LOMASNEY WAY
STORROW DRIVE
MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
NORTH STATION TRANSPORTATION IMPROVEMENT PROJECT
M.B.T.A. Contract No. 120-003
EXISTING CONDITIONS

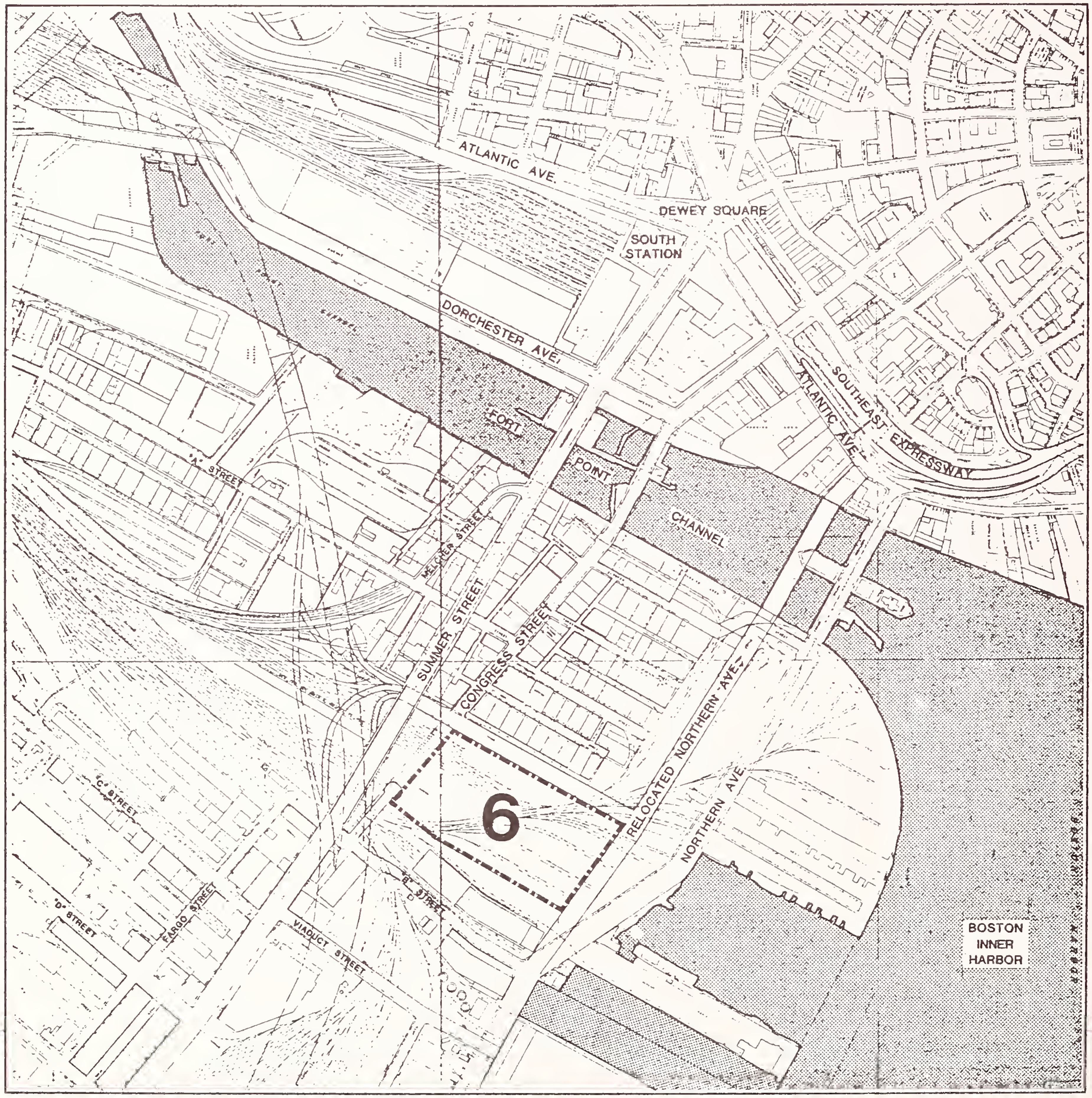
NORTH STATION AREA: RENOVATION OF GARDEN SITE

EXHIBIT 5-5


ATLANTIC AVE.
DEWEY SQUARE
SOUTH STATION
DORCHESTER AVE.
SOUTHEAST EXPRESSWAY
ATLANTIC AVE.
FORT
POINT
CHANNEL
5
ARENA
A STREET
MELCHER STREET
SUMMER STREET
CONGRESS STREET
RELOCATED NORTHERN AVE.
NORTHERN AVE.
PARKING
C STREET
D STREET
FARGO STREET
VIADUCT STREET
B STREET
BOSTON INNER HARBOR
0 100 200 400

FORT POINT CHANNEL / SOUTH STA. AREA: ROSE PROPERTY

EXHIBIT 5-6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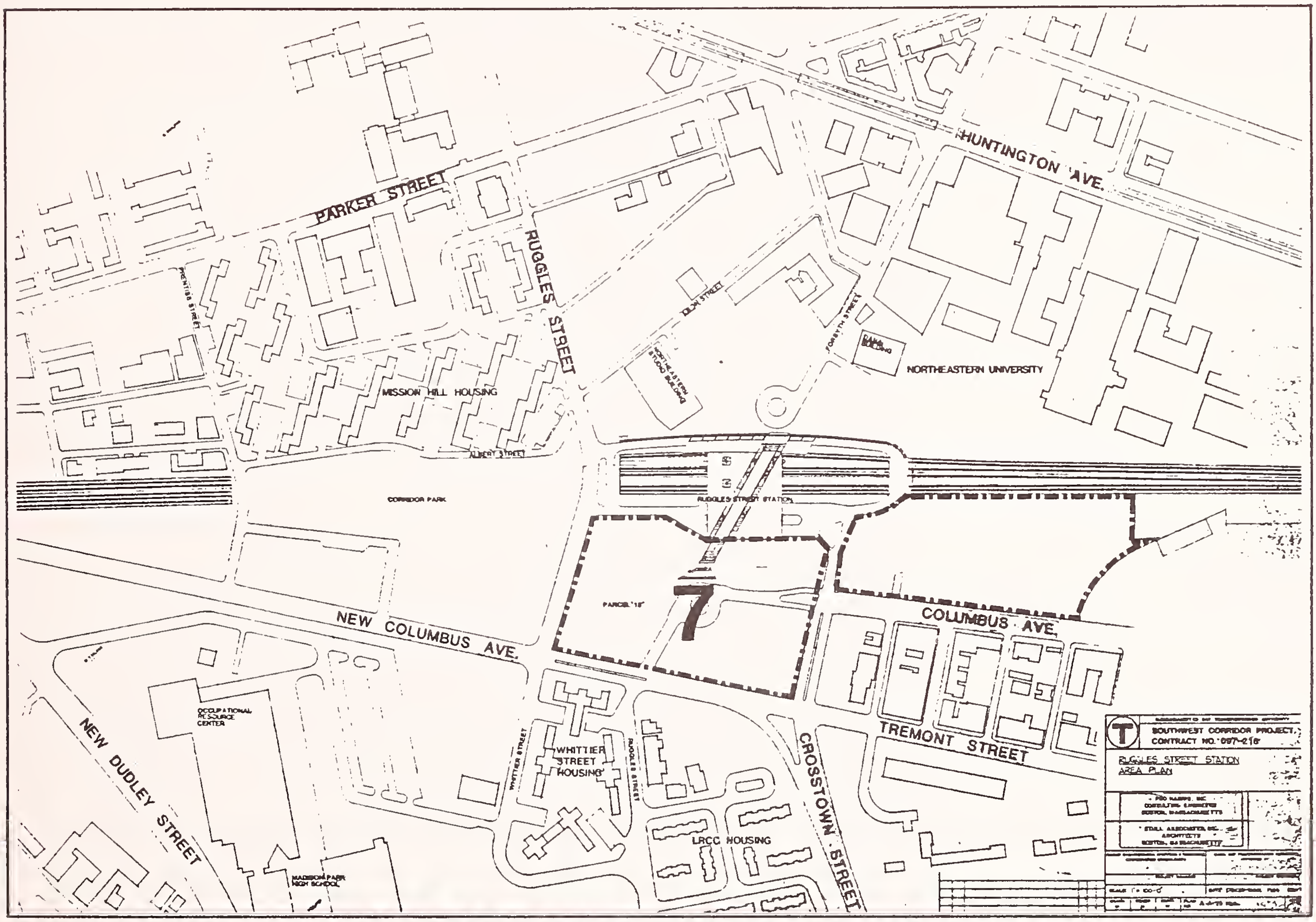
DEWEY SQUARE
SOUTH STATION
DORCHESTER AVE.
FORT
POINT
CHANNEL
SOUTHEAST EXPRESSWAY
ATLANTIC AVE.
"A" STREET
MELCHER STREET
SUMMER STREET
CONGRESS STREET
RELOCATED NORTHERN AVE.
NORTHERN AVE.
6
"C" STREET
"D" STREET
FARGO STREET
"B" STREET
VIADUCT STREET
BOSTON INNER HARBOR

FORT POINT CHANNEL /SOUTH STA. AREA: C.C.F. PROPERTY

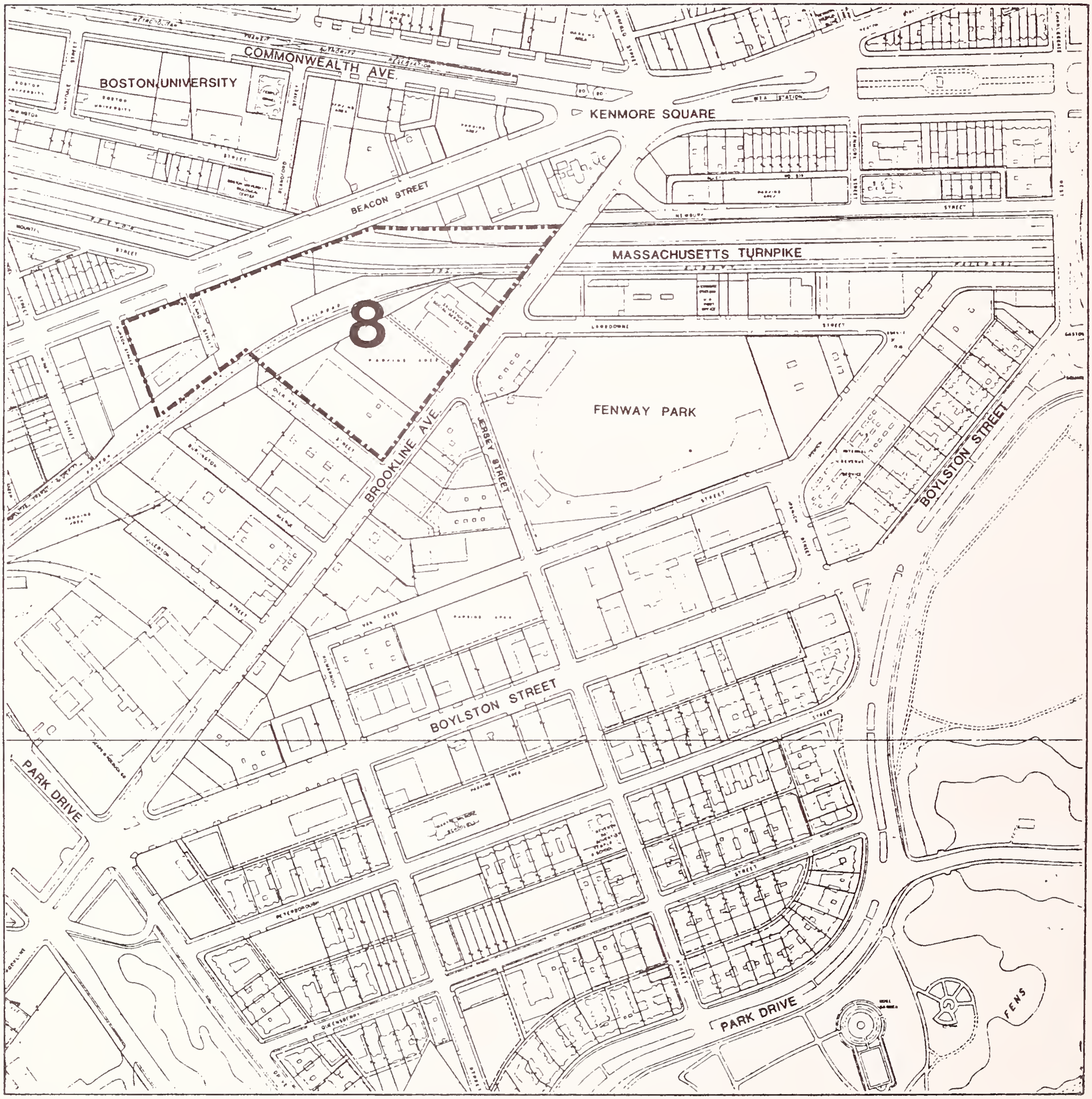
0 100 200 400

EXHIBIT 5-7


PARKER STREET
HUNTINGTON AVE.
RUGGLES STREET
PRENTISS STREET
DIXON STREET
FORSYTH STREET
NORTHEASTERN UNIVERSITY
NORTHEASTERN STUDIO BUILDING
DANA BUILDING
MISSION HILL HOUSING
ALBERT STREET
CORRIDOR PARK
RUGGLES STREET STATION
PARCEL "18"
7
NEW COLUMBUS AVE.
COLUMBUS AVE.
TREMONT STREET
CROSSTOWN STREET
NEW DUDLEY STREET
OCCUPATIONAL RESOURCE CENTER
MADISON PARK HIGH SCHOOL
WHITTIER STREET
WHITTIER STREET HOUSING
RUGGLES STREET
LRCC HOUSING
T
SOUTHWEST CORRIDOR PROJECT,
CONTRACT NO. 097-216
RUGGLES STREET STATION
AREA PLAN
ARCHITECTS
SCALE 1" = 100'-0"

SOUTHWEST CORRIDOR AREA: PARCEL 18 SITE

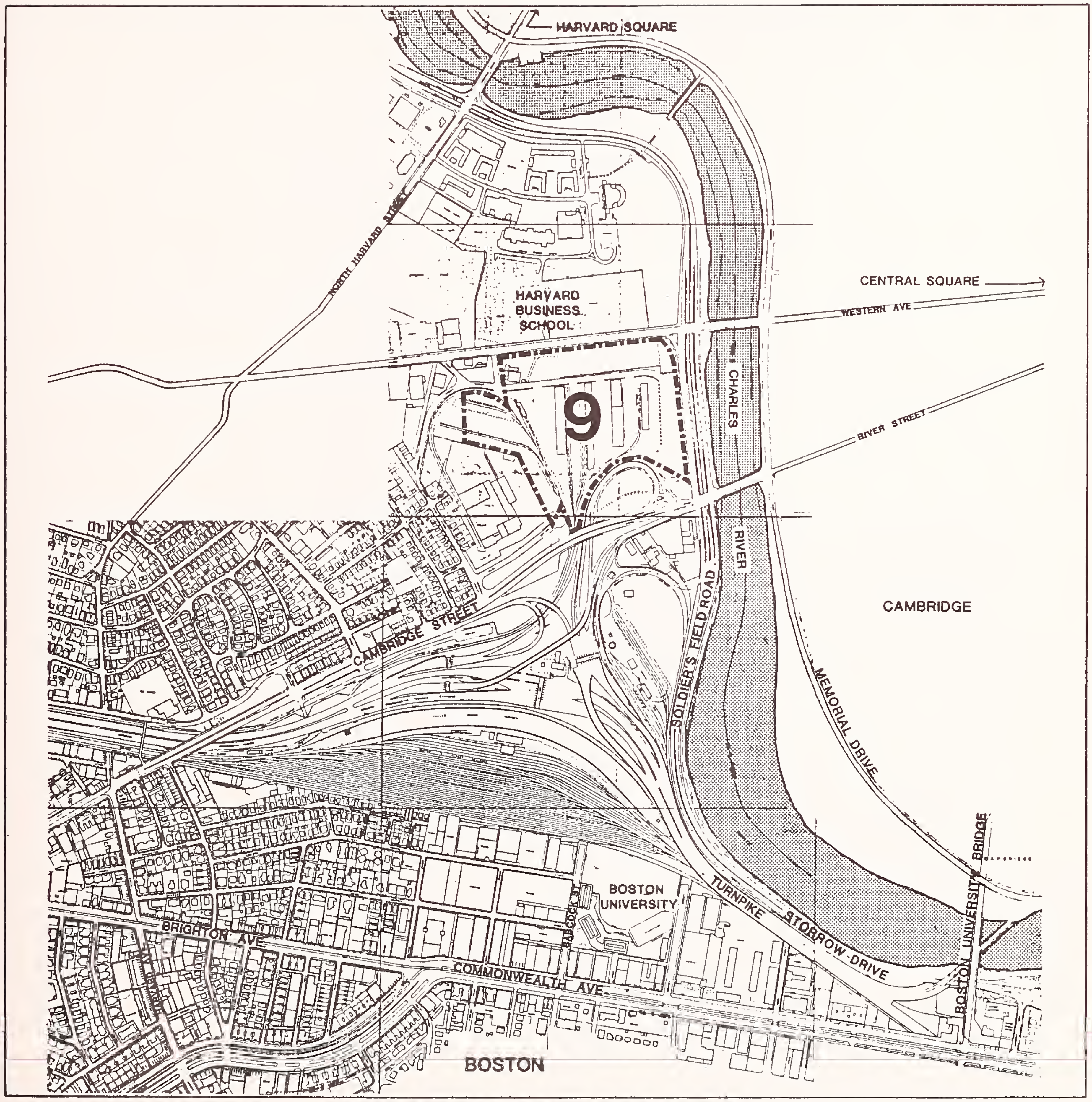
EXHIBIT 5-8


COMMONWEALTH AVE.
BOSTON UNIVERSITY
KENMORE SQUARE
BEACON STREET
MASSACHUSETTS TURNPIKE
8
FENWAY PARK
BROOKLINE AVE.
JERSEY STREET
BOYLSTON STREET
BOYLSTON STREET
PARK DRIVE
PARK DRIVE
FENS

KENMORE SQ. – MASS. PIKE SITE

0
100
200
400

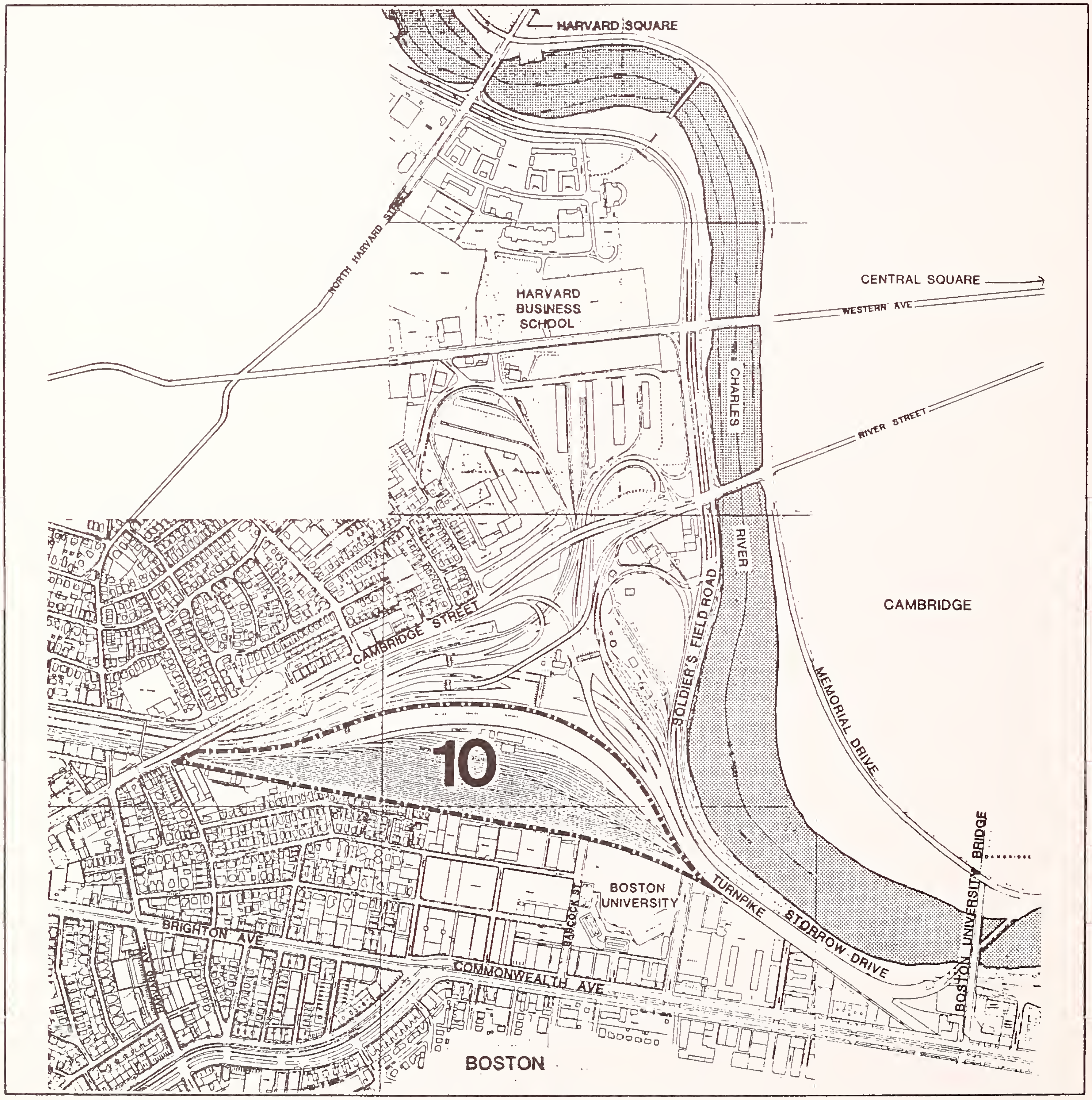
EXHIBIT 5-9


HARVARD SQUARE
NORTH HARVARD STREET
HARVARD BUSINESS SCHOOL
CENTRAL SQUARE
WESTERN AVE
9
CHARLES
RIVER
RIVER STREET
CAMBRIDGE
CAMBRIDGE STREET
SOLDIER'S FIELD ROAD
MEMORIAL DRIVE
BOSTON UNIVERSITY BRIDGE
BOSTON UNIVERSITY
BABCOCK ST
TURNPIKE
STORROW DRIVE
BRIGHTON AVE
COMMONWEALTH AVE
BOSTON

ALLSTON AREA: WESTERN AVENUE SITE

0 200 400 600

EXHIBIT 5-10

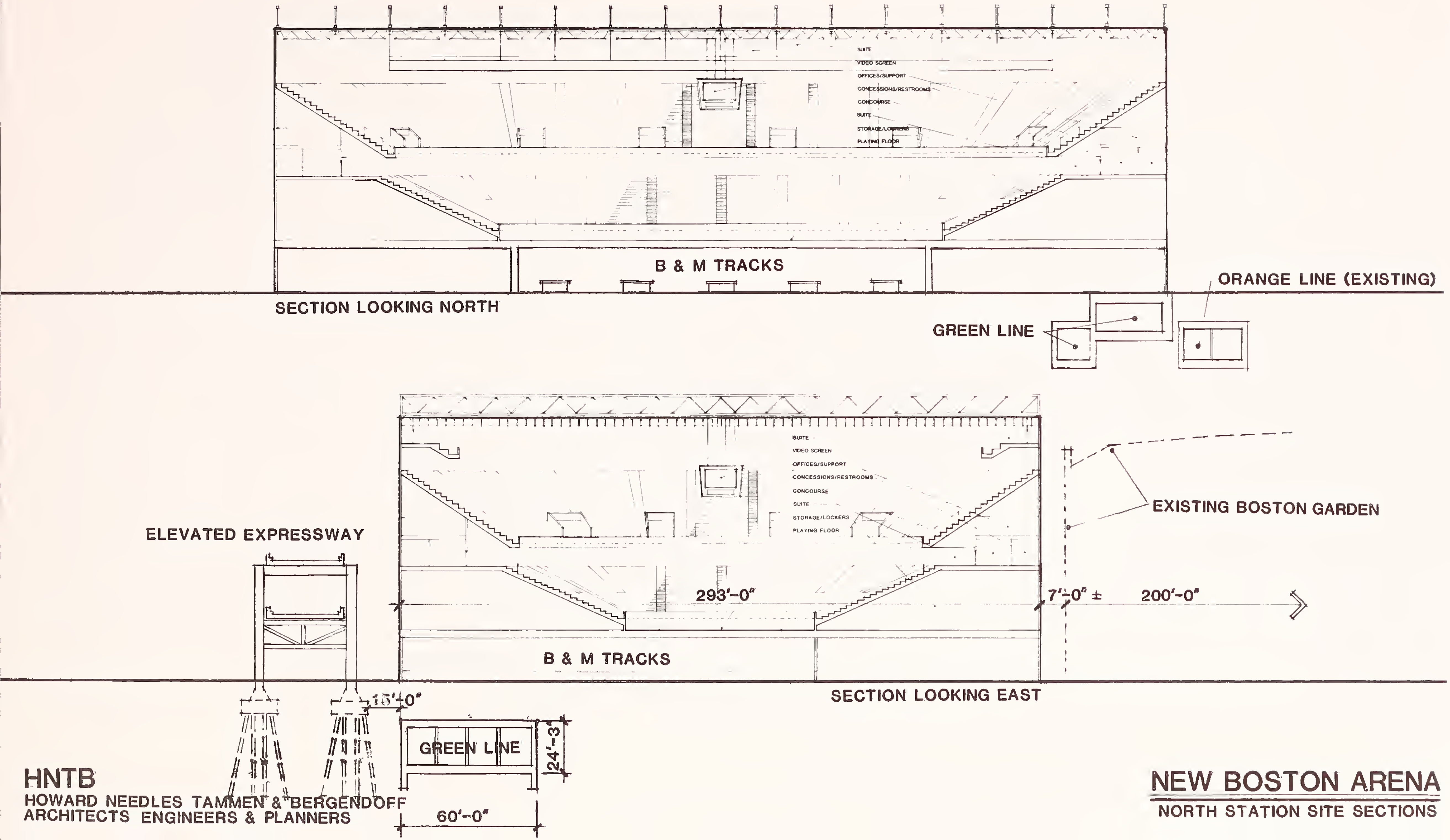

HARVARD SQUARE
NORTH HARVARD STREET
HARVARD BUSINESS SCHOOL
CENTRAL SQUARE
WESTERN AVE
RIVER STREET
CHARLES
RIVER
CAMBRIDGE
CAMBRIDGE STREET
SOLDIER'S FIELD ROAD
MEMORIAL DRIVE
10
BOSTON UNIVERSITY
BOSTON UNIVERSITY BRIDGE
TURNPIKE
STORROW DRIVE
BABCOCK ST
BRIGHTON AVE
HARVARD AVE
COMMONWEALTH AVE
BOSTON

ALLSTON AREA: CONRAIL SITE

0
200
400
600

EXHIBIT 6-1

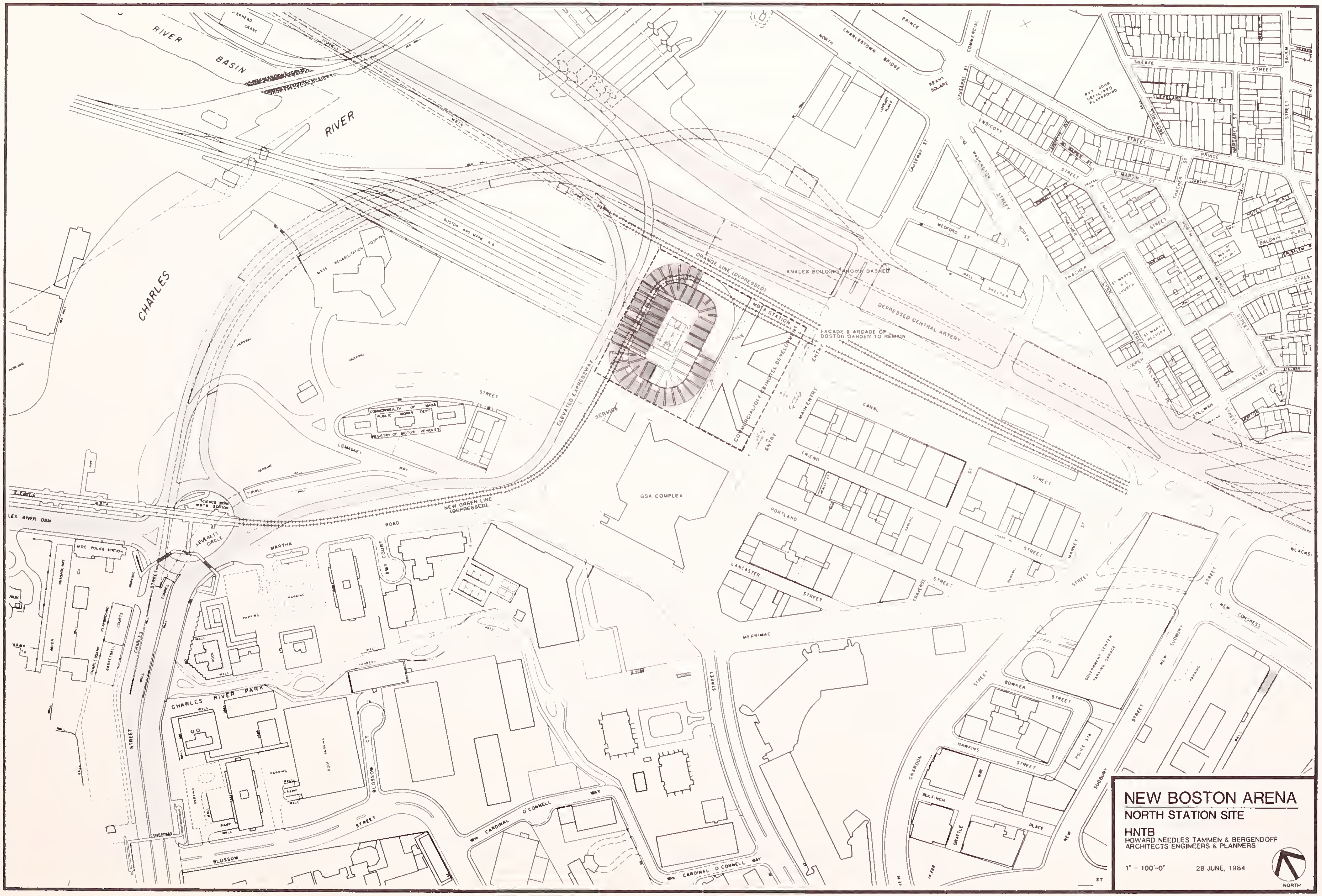
*NOTE: 15'-0" MINIMUM DIMENSION REQUIRED TO CLEAR EXPRESSWAY PILINGS IF SUPERSTRUCTURE OF ARENA IS AT PERIMETER . IF SUPERSTRUCTURE SUPPORTS ARE INSET DIMENSION MAY BE REDUCED.


SUITE
VIDEO SCREEN
OFFICES/SUPPORT
CONCESSIONS/RESTROOMS
CONCOURSE
SUITE
STORAGE/LOCKERS
PLAYING FLOOR
B & M TRACKS
SECTION LOOKING NORTH
ORANGE LINE (EXISTING)
GREEN LINE
SUITE
VIDEO SCREEN
OFFICES/SUPPORT
CONCESSIONS/RESTROOMS
CONCOURSE
SUITE
STORAGE/LOCKERS
PLAYING FLOOR
EXISTING BOSTON GARDEN
ELEVATED EXPRESSWAY
293'-0"
7'-0" ±
200'-0"
B & M TRACKS
SECTION LOOKING EAST
15'-0"
GREEN LINE
24'-3"
60'-0"

HNTB
HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS & PLANNERS

NEW BOSTON ARENA
NORTH STATION SITE SECTIONS

EXHIBIT 6–2


CHARLES
RIVER
BASIN
RIVER
MASS. REHABILITATION HOSPITAL
BOSTON AND MAINE R.R.
ORANGE LINE (DEPRESSED)
ANALEX BUILDING SHOWN DASHED
MBTA STATION
DEPRESSED CENTRAL ARTERY
FACADE & ARCADE OF BOSTON GARDEN TO REMAIN
COMMERCIAL/OFFICE/HOTEL DEVELOPMENT
MAIN ENTRY
ENTRY
SERVICE
ELEVATED EXPRESSWAY
NEW GREEN LINE (DEPRESSED)
GSA COMPLEX
COMMONWEALTH OF MASS. PUBLIC WORKS DEPT. REGISTRY OF MOTOR VEHICLES
SCIENCE PARK MBTA STATION
LEVERETT CIRCLE
MDC POLICE STATION
CHARLES RIVER PARK
BLOSSOM STREET
BLOSSOM CT
CHARLES STREET
CARDINAL O'CONNELL WAY
MARTHA ROAD
AMY COURT
LOMASNEY WAY
MERRIMAC STREET
CANAL STREET
FRIEND STREET
PORTLAND STREET
LANCASTER STREET
TRAVERSE STREET
MARKET ST
CHARDON STREET
BOWKER STREET
HAWKINS STREET
BULFINCH PLACE
GRATTLE
SUDBURY STREET
NEW SUDBURY STREET
NEW CONGRESS STREET
GOVERNMENT CENTER PARKING GARAGE
POLICE STA.
BLACKSTONE
NORTH CHARLESTOWN BRIDGE
PRINCE
COMMERCIAL
KEANY SQUARE
CAUSEWAY ST
MEDFORD ST
WASHINGTON STREET NORTH
ENDICOTT STREET
THACHER ST
N. MARGIN ST
NORTH MARGIN STREET
STILLMAN STREET
COOPER
ST. MARY'S R.C. CHURCH
ST. MARY'S RECTORY
BALDWIN PLACE
SHEAFE STREET
SALEM
CLEVELAND PLACE
MARGARET ST
PRINCE STREET
ROOF PARKING
PARKING
POOL
BASKETBALL COURTS
PLAYGROUND
TUNNEL

NEW BOSTON ARENA
NORTH STATION SITE

HNTB
HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS & PLANNERS

1" - 100'-0" 28 JUNE, 1984

NORTH

EXHIBIT 6-3

NORTH STATION AREA - EXISTING PUBLIC PARKING

LOCATION	CAPACITY
45 Nashua Street	375
52 Billerica Street	51
44 Nashua Street	9
36 Accolon Way	406
131 Beverly Street	53
26-28 Lancaster Street	25
160 Portland Street	125
235-239 Friend Street	27
308-320 Friend Street	41
37 Merrimac Street	45
89-91 Canal Street	10
North Washington Street	63
Hawthorne Pl./Martha Road (Charles River Park Public Parking)	900
Government Center Garage	1,865
Blossom Street	30
Charles River Plaza (O'Connell Way)	794
Charles River Plaza (O'Connell Way)	160
558 Commercial Street	49
15 Cross Street	65
TOTAL	5,093

Note: There are an estimated 400 on-street spaces in this area.

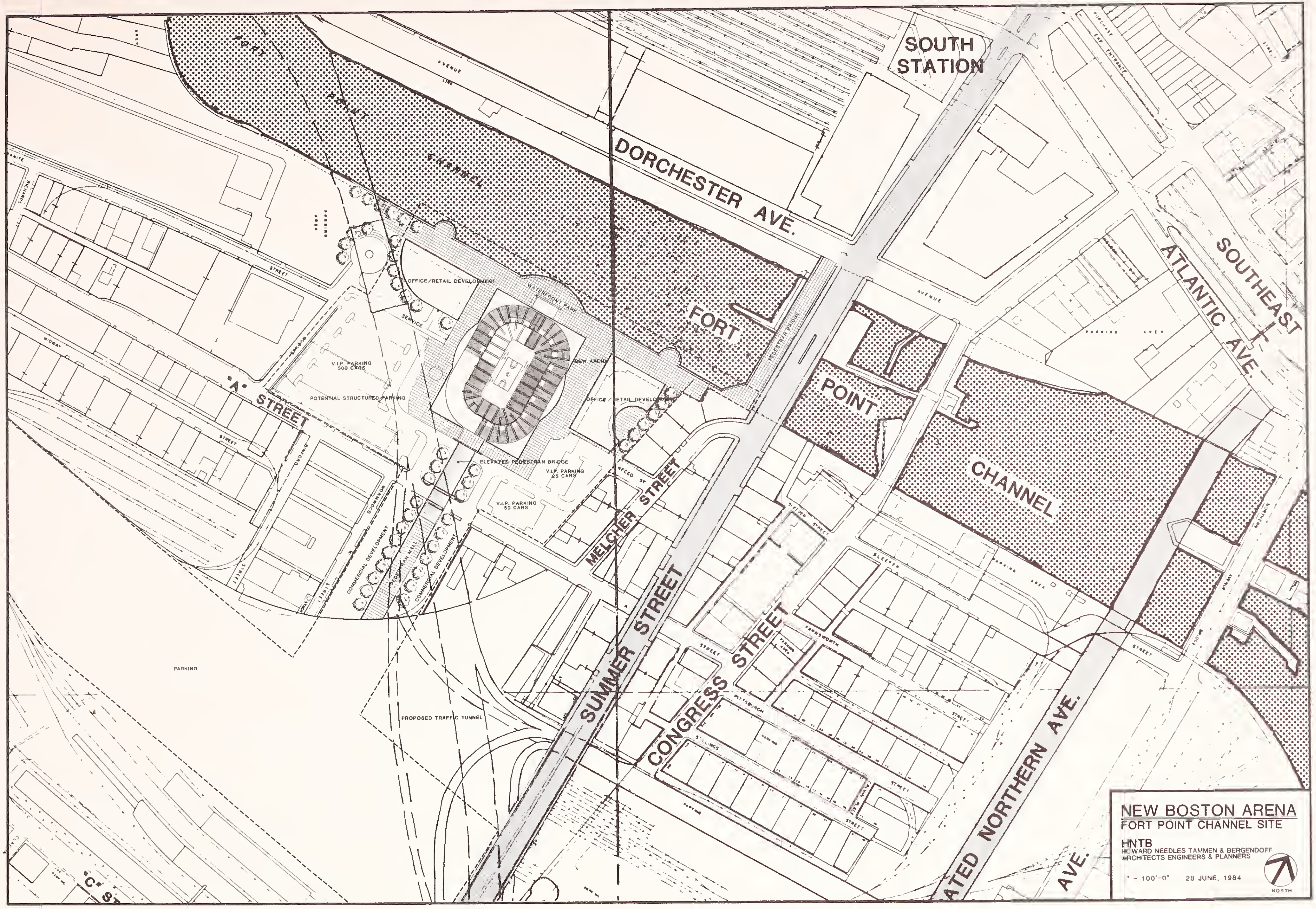
Source:
- o "Inventory of Off-Street Parking Facilities Within Boston Proper" - BRA; April, 1981
- o 1982 BTPD Listing of Open Air Lots
- o Interview of Owners/Operators of Selected Facilities

EXHIBIT 6-4

NORTH STATION AREA – PARKING ANALYSIS

Existing Off-Street Supply Within 2,000 feet of sites	5,100 spaces
Spaces Lost to Arena Building	- 780
Subtotal	4,320
Assume 90% Available to Arena	x 0.90
EXISTING OFF-STREET SUPPLY AVAILABLE TO ARENA	3,890
Existing On-Street Supply Available to Arena	+ 360
TOTAL SUPPLY AVAILABLE TO ARENA	4,250
ARENA PARKING DEMAND 18,000 (Seats) by 0.80 (Auto) divided by 2.75 (Auto Occupancy)	5,250
PARKING DEFICIENCY	
Assuming Use of On-Street Spaces	1,000
Assuming On-Street Spaces Not Used	1,360

EXHIBIT 6-5


SOUTH STATION
DORCHESTER AVE.
ATLANTIC AVE.
SOUTHEAST
FORT
POINT
CHANNEL
SUMMER STREET
CONGRESS STREET
MELCHER STREET
NORTHERN AVE.
"A" STREET
"C" ST
PURCHASE
EXP. ENTRANCE
AVENUE
OFFICE/RETAIL DEVELOPMENT
WATERFRONT PARK
NEW ARENA
SERVICE
V.I.P. PARKING 300 CARS
POTENTIAL STRUCTURED PARKING
ELEVATED PEDESTRIAN BRIDGE
V.I.P. PARKING 25 CARS
V.I.P. PARKING 50 CARS
PEDESTRIAN BRIDGE
COMMERCIAL DEVELOPMENT
PEDESTRIAN MALL
PROPOSED TRAFFIC TUNNEL
PARKING
NECCO ST
SLEEPER STREET
FARNSWORTH
PITTSBURGH
STILLINGS
BINFORD
WORMWOOD
MIDWAY
RICHARDS
STREET
NORTH

NEW BOSTON ARENA
FORT POINT CHANNEL SITE

HNTB
HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS & PLANNERS

" - 100'-0" 28 JUNE, 1984

EXHIBIT 6-6

FORT POINT CHANNEL AREA - EXISTING PUBLIC PARKING

LOCATION	CAPACITY
338 Summer Street	18
26 Pittsburg Street	34
25 Northern Avenue	707
28-52 Northern Avenue (Fan Pier)	450
191 A Street	50
246 A Street	629
275 A Street	150
474-476 Atlantic Avenue	220
300 Congress Street	54
Conrail Tracks (near Viaduct Street)	1,908
TOTAL	4,220

Note: There are an estimated 1,200 on-street spaces in this area.

Source: "Parking in Central Boston: Meeting the Access Needs of a Growing Downtown"
Boston Traffic & Parking Department: December, 1983

EXHIBIT 6-7

ROSE PROPERTY / FORT POINT CHANNEL – PARKING ANALYSIS

Existing Off-Street Supply within ½ mile of site	4,200 spaces
Spaces Lost to Fan Pier Development	- 450
Spaces Lost to Relocated Northern Avenue	- 710
Spaces Lost to Arena Building	- 780
Subtotal	2,280
Assume 90% Available to Arena	x 0.90
EXISTING OFF-STREET SUPPLY AVAILABLE TO ARENA	2,050
Existing On-Street Supply Available to Arena (1,200 x 0.90)	+ 1,080
Proposed Parking @ South Station (2,000 x 0.90)	+ 1,080
TOTAL SUPPLY AVAILABLE TO ARENA	4,930
ARENA PARKING DEMAND 18,000 (seats) x 0.80 (Auto) Divided by 2.75 (Auto Occupancy)	5,250
PARKING DEFICIENCY	
Assuming use of On-Street Spaces	320
Assuming On-Street Spaces Not Used	1,400

EXHIBIT 6-8

PREMIUM COST FOR A NEW ARENA AT NORTH STATION

1)	STRUCTURE		$ 6.0 m
	*Vertical (air rights)	$4.0 m	
	Horizontal (space frame)	$2.0 m	
2)	*VENTILATION		.5
3)	*LIGHTING		.5
4)	*PLATFORM FINISHES		.75
5)	*FIRE PROTECTION		.25
6)	*VERTICAL CIRCULATION		4.0
7)	*UTILITIES		1.0
8)	PHASED CONSTRUCTION		2.5
9)	DIMENSIONALLY RESTRICTED SITE		1.0
10)	DEMOLITION OF BOSTON GARDEN		2.5

	SUB-TOTAL	$ 19.0 m
ADDITIONAL FEES @ 8%		1.5
		20.5
CONTINGENCY @ 10%		2.1
	TOTAL PREMIUM	22.6 million

* DIRECTLY ATTRIBUTABLE TO AIR RIGHTS CONDITION	$13.0 m
ATTRIBUTABLE TO OTHER NORTH STATION SITE CONSTRAINTS	9.6 m
	$22.6 m

NOTE: All figures in mid-1984 dollars

EXHIBIT 6-9

COMPARATIVE DEVELOPMENT COST DIFFERENTIALS : NORTH STATION AND FORT POINT CHANNEL / SOUTH STATION

To ascertain the order of magnitude for development cost differentials between new arena sites at the Fort Point Channel/South Station and North Station, a comparative analysis was undertaken by the feasibility study team. This analysis did not attempt to identify total development costs, but rather compared the differences of costs associated with site acquisition and construction premiums.

METHODOLOGY

The analysis consisted of the following steps:

1. Identification of construction cost premiums associated with building an arena above commuter rail tracks at North Station. The site assumed for this analysis lies between the existing Garden and the expressway ramps to the north, although some phased construction on the site of the Garden following its demolition is required.

2. Identification of construction cost premiums associated with building an on-grade arena at Fort Point Channel/South Station. The on-grade arena assumed at this site is the base condition against which North Station premiums are compared.

3. Identification of net acquisition costs of the North Station and the Fort Point Channel sites. This analysis identified costs associated with acquiring the parcels required for construction, then deducted the income that would be derived from the sale of excess land for development.

4. For each site, an approximate Development Cost Differential was determined. This figure identifies how much more an arena project would cost on each site compared to an arena with no premium costs for construction or acquisition.

5. Finally, the two Development Cost Differentials were compared to each other. The worst condition at Fort Point Channel/South Station was subtracted from the best condition at North Station, and the best condition at Fort Point Channel/South Station was subtracted from the worst condition at North Station, to yield the range by which the development costs at North Station could exceed those at Fort Point Channel/South Station.

EXHIBIT 6-9 (Continued)

ASSUMPTIONS

The assumptions upon which this comparative analysis is based include the following:

1. All dollar figures are mid-1984 costs.

2. The same time of start-up of construction on each site is assumed.

3. For an arena at North Station, complete coordination with MBTA improvements is assumed, including a logical construction sequence.

4. For the North Station scenario used in this comparison, it is assumed that the existing Garden and Analex building remain in use during construction of the new arena.

5. Similar geological conditions for each site are assumed for purposes of this comparison; a detailed comparison has not been made.

6. Tenant relocation costs for the retail uses in the Boston Garden and buildings along Necco Court are not included.

7. Costs for developing parking for each site are not included. Although acquisition and construction costs for structured parking at North Station will be more expensive than on-grade parking at Fort Point Channel/South Station, it is felt that each parking solution will pay for itself. Therefore, although greater capital costs for parking will be incurred at North Station, it is not a premium cost for purposes of this comparison since parking there will generate a greater revenue stream than at the Fort Point Channel site.

8. Net site acquisition costs vary according to the intensity of development which would take place on the excess land that would be disposed of following arena construction. The ranges of disposition income reflect a reasonable range of the scale of development.

9. It is assumed that basic professional fees for implementing the project on each site would be the same; additional fees associated with the construction premiums at North Station are included in the analysis.

10. Identification of cost premiums for each site in no way is meant to suggest that these costs be fully borne by the developer of the arena.

MASSACHUSETTS CONVENTION CENTER AUTHORITY
MULTI-PURPOSE ARENA FEASIBILITY STUDY

DEVELOPMENT COST DIFFERENTIAL

NORTH STATION

Estimated Acquisition Cost	$13,000,000 - 15,000,000
Less value of excess land for private development (assumes prepared site)	7,000,000 - 5,000,000
NET ACQUISITION COST	6,000,000 - 10,000,000
Site Premium	9,600,000 - 9,600,000
Air Rights Premium	13,000,000 - 13,000,000
Development Cost Differential Base (exclusive of building, fees)	28,600,000 - 32,600,000

FORT POINT CHANNEL

Estimated Acquisition Cost A Street/Necco Court	$14,000,000 - 14,000,000
Less value of excess land for private development	4,000,000 - 2,000,000
NET ACQUISITION COST	10,000,000 - 12,000,000
Site Premium	
Seawall/Walkway	1,000,000 - 2,000,000
Roadway Improvements	1,000,000 - 2,000,000
Development Cost Differential Base (exclusive of building, fees)	12,000,000 - 16,000,000

COMPARISON OF COST DIFFERENTIAL BASE

North Station	28,600,000 - 32,600,000
Fort Point Channel/South Station	16,000,000 - 12,000,000
DIFFERENTIAL RANGE	$12,600,000 - 20,600,000

Note: All figures in mid-1984 dollars

EXHIBIT 10-1

NEW ARENA AT NORTH STATION
ASSUMED AVERAGE TICKET PRICES BY EVENT TYPE

	1984	1992
BOSTON CELTICS		
- Regular	$15.00	$23.02
- Playoff	19.00	29.16
BOSTON BRUINS		
- Regular	13.50	20.72
- Playoff	17.00	26.09
FAMILY SHOWS	8.75	13.43
CONCERTS	13.00	19.95
COLLEGE & HIGH SCHOOL	8.70	13.35
OTHER	9.40	14.43
OVERALL AVERAGE	$12.61	$19.35

NOTES: Based on analyses of current and historical ticket prices at the Boston Garden, interviews with industry professionals, and an assumed inflation rate of 5.5% per year (to yield 1992 ticket price estimates).

EXHIBIT 10-2

NEW ARENA AT NORTH STATION
NON-EVENT EXPENSE DETAIL

EXPENSE CATEGORY	($ in thousands) 1984	 1992
Administration	$ 626	$ 961
Admissions	55	84
Box Office	526	807
Security	301	462
Operations	1,905	2,923
Utilities	1,000	1,535
Scoreboard	48	74
Marketing, Public Relations, and Group Sales	392	601
PILOT (Payments in Lieu of Taxes)	400	614
Other	850	1,305
	$6,103	$9,366

EXHIBIT 10-3

NEW ARENA AT NORTH STATION
REPLACEMENT RESERVE PROVISION CALCULATION

ITEM	1992 ($ in thousands)
Arena Construction	$ 74,800
Equipment Requirements	2,795
Galleria Construction	1,320
Subtotal - Construction and Equipment	78,915
Contingency @ 5%	3,946
Subtotal - Construction, Equipment, and Contingency	82,861
Inflation Provision	17,986
Inflated Project Cost	$100,847
Annual Replacement Reserve, Based on 30 Year Average Life	$ 3,362

NOTES: Inflation provision based on 5.5% per year construction cost escalation, and the assumed construction schedule.

EXHIBIT 10-4

NEW ARENA AT NORTH STATION
SUMMARY REVENUE AND EXPENSE PROFILE

	($ in thousands) 1984	($ in thousands) 1992
Number of Events	240	240
Attendance (000's)	2,811	2,811
EVENT REVENUES		
Rent/Admission	$11,437	$17,552
Concession	3,225	4,950
Reimbursement of Expense	1,361	2,088
Other	96	147
Total Revenue	16,119	24,737
EVENT EXPENSES		
Payroll Related	2,953	4,532
Outside Security	483	741
Maintenance	457	701
Licensee Participation		
- Concession	195	299
- Other	4,506	6,915
Other Expense	1,183	1,815
Total Expense	9,777	15,003
NET EVENT REVENUE	6,342	9,734
NON-EVENT EXPENSE	(6,103)	(9,366)
OTHER INCOME	2,632	4,040
CASH FLOW FROM OPERATIONS	$ 2,871	$ 4,408
OTHER CASH SOURCES/(REQUIREMENTS)		
Replacement Reserve Provision (Independent of Financing Plan)	(2,762)	(3,362)
Lease Proceeds from Development Parcel	1,200	1,842
CASH AVAILABLE FOR DEBT SERVICE	$ 1,309	$ 2,888

Source: Touche Ross & Co. estimates for events, attendance, revenues, and operating expenses at a new arena in Boston.

EXHIBIT 11-1

ESTIMATED CONSTRUCTION COST FOR A NEW ARENA
(Mid-1984 Dollars)

ESTIMATED CONSTRUCTION COST FOR A NEW ARENA (mid-1984 dollars)

CSI DIVISION	PHASE I Subgrade & Ice Level	PHASE II Arena	PHASE III Garden Demolition	PHASE IV Galleria
01 GENERAL CONDITIONS	$ 2,800,000	$ 7,500,000		$ 730,000
02 SITE WORK	2,843,000		$ 2,500,000	-
03 CONCRETE	7,194,000	15,040,000		390,000
04 EXTERIOR WALLS	396,000	4,100,000		1,765,000
05 METALS	150,000	4,350,000		410,000
06 INTERIOR PARTITIONS		1,900,000		170,000
07 ROOFING		3,500,000		1,450,000
08 DOORS & WINDOWS (INCLUDED IN 04 & 06)		-		-
09 FINISHES	750,000	2,915,000		350,000
10 SPECIALTIES	2,092,000	807,000		-
11 EQUIPMENT	-	940,000		-
12 FURNISHINGS	-	1,915,000		-
13 SPECIAL CONSTRUCTION	2,000,000	995,000		135,000
14 CONVEYANCE SYSTEMS	2,100,000	1,780,000		640,000
15 MECHANICAL	1,950,000	6,250,000		395,000
16 ELECTRICAL	625,000	2,880,000		300,000
CONTINGENCY ALLOWANCE (2)	2,100,000	5,128,000		765,000
TOTALS (3)	$25,000,000	$60,000,000	$ 2,500,000	$7,500,000 (1)

(1) The Galleria construction would be divided between the MCCA ($1,500,000) and the MBTA ($6,000,000), for a total of $7,500,000.

(2) A design contingency of ten percent (10%) is included for construction items.

(3) All figures are based on public lump-sum bidding procedures with a general contractor.

EXHIBIT 11-2

ESTIMATED TOTAL PROJECT COST FOR A NEW ARENA
(Mid-1984 Dollars in Thousands)

		Conventional Public Construction Approach		Construction Management Approach
A) Land and Structures Acquisition		$ 23,000		$ 23,000
B) Facility Construction Cost				
1) Subsurface and Slab	$25,000		$22,000	
2) Arena	60,000		52,800	
3) Galleria (MCCA portion)	1,500		1,320	
4) Selected Equipment and Outfitting	2,795		2,795	
		89,295		78,915
Subtotal - Acquisition and Construction		112,295		101,915
C) Garden Demolition		2,500		2,200
D) Final Design, Engineering, and EIR cost		5,340		4,120
E) Project Contingency		4,857		4,438
F) Construction Management Fee		-		3,530
TOTAL PROJECT COST (mid-1984 dollars)		$124,992		$116,203

EXHIBIT 11-3

CONSTRUCTION DRAWDOWN SCHEDULE
(Dollars in Thousands)

CONSTRUCTION DRAWDOWN SCHEDULE WITH CONTINGENCIES IN INFLATED DOLLARS
(Dollars in Thousands)

Calendar Quarter Ended (1)	Total Drawdown Prior to Project Contingency (2)	Project Contingency Amount	Project Total Drawdown Including Contingecy	Inflation Index (3)	Inflated Drawdown (4)
09/30/85	$ 0	$ 0	$ 0	1.0695	$ 0
12/31/85	8,846	42	8,888	1.0840	9,635
03/31/86	846	42	888	1.0985	976
06/30/86	746	37	783	1.1130	872
09/30/86	2,846	142	2,988	1.1283	3,372
12/31/86	6,146	307	6,453	1.1436	7,380
03/31/87	7,896	395	8,291	1.1589	9,609
06/30/87	8,796	440	9,236	1.1742	10,845
09/30/87	8,936	447	9,383	1,1904	11,169
12/31/87	9,461	473	9,934	1.2065	11,986
03/31/88	8,736	437	9,173	1.2227	11,215
06/30/88	8,261	413	8,674	1.2377	10,746
09/30/88	6,386	319	6,705	1.2559	8,421
12/31/88	5,617	281	5,898	1.2729	7,507
03/31/89	5,018	251	5,269	1.2899	6,796
06/30/89	18,968	198	19,166	1.3070	25,050
09/30/89	1,065	53	1,118	1.3249	1,482
12/31/89	1,505	75	1,580	1.3429	2,122
03/31/90	185	9	194	1,3609	264
06/30/90	1,505	75	1,580	1.3788	2,179
	$111,765	$4,438	$116,203		$141,626

(1) See Construction Schedule, Figure 12-7
(2) For all project costs except Project Contingency
(3) 5.5% annual rate; 7/1/84 Index = 1.000
(4) Inflation Index multiplied times Total Drawdown

EXHIBIT 12-1

DETAILED CONSTRUCTION SCHEDULE FOR A NEW ARENA

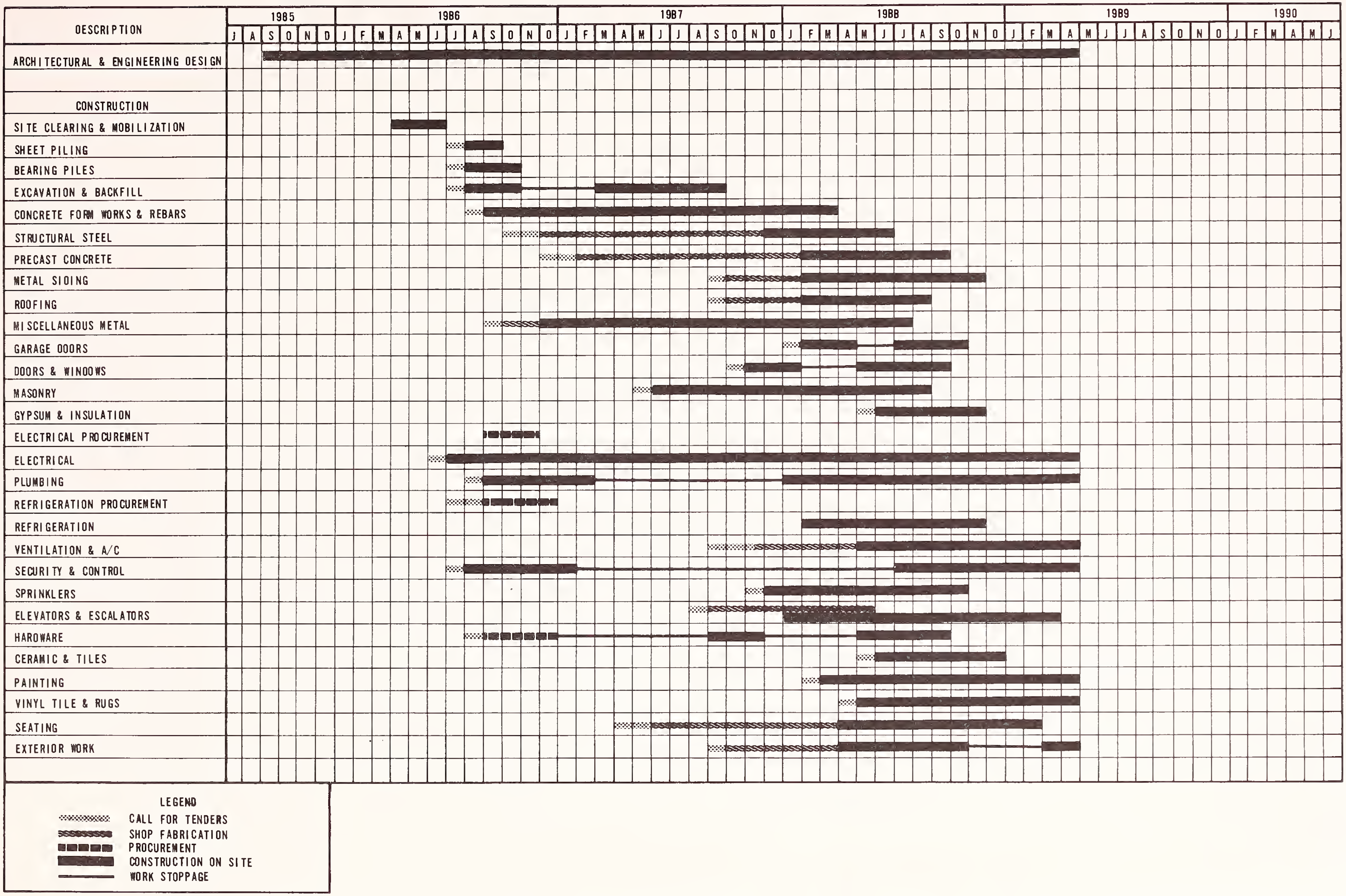


EXHIBIT 13-1

NEW ARENA HYPOTHETICAL BOND SIZE COMPARISON: GENERAL OBLIGATION VERSUS REVENUE BONDING APPROACHES
(Millions of Dollars)

FUNDING REQUIREMENT	GENERAL OBLIGATION BOND	REVENUE BOND
Land and Structures Acquisition	$ 23.0	$ 23.0
Arena Construction Costs	81.1	81.1
Construction Mgmt. Fee	3.5	3.5
Design and EIS fees	4.1	4.1
Construction Contingency	4.4	4.4
Inflation Adjustment for 63 Month Construction Cycle	25.5	25.5
Subtotal-Development Funds	141.6	141.6
Plus: Financing & Bond Issuance Costs	3.4	7.2
Debt Service Reserve Fund	-	28.6
Rounding, Fund Ending Balances, and Capitalization Interest During Construction	-	133.6
Less: Earnings During Construction on:		
. Construction Fund & Float	30.6	27.2
. Debt Service Reserve Fund	-	15.7
. Capitalized Interest Fund	-	29.6
Equals: Total Net Bonding Requirement	$114.4	$238.5
Estimated Annual Debt Service on Bonding Requirement	$ 13.2	$ 28.6

Major Assumptions:

1. See text of report for description of process by which bond sizing estimates were developed
2. Construction costs based on Study Team estimates described in chapters 11 and 12.
3. Interest rates (October 15, 1984):
   - 10.5% on bonds
   - 9.5% on fund balances during construction
4. Revenue bonding approach assumes funding of a debt service reserve fund and capitalized interest during construction; the general obligation bonding approach does not fund capitalized interest or a debt service reserve fund.

EXHIBIT 13-2

COMPARATIVE GENERAL SALES TAX RATES FOR MAJOR U.S. CITIES

City	General Sales Tax Rate (%) State	City	Total	Use of Revenue
Atlanta	4	1	5	. 80% to General Fund . 20% to city transit
Atlantic City	6	6	12	. General Fund
Chicago	8	-	8	. General Fund
Cleveland	5	1/2 to 3	5-1/2 to 8	. General Fund
Dallas	4	2	6	. 1% for mass transit . Balance to General Fund
Detroit	4	-	4	. General Fund
Houston	4	2	6	. 1% for mass transit . Balance to General Fund
Indianapolis	5	1	6	. 1% for Hoosier Dome . Balance to State General Fund
Las Vegas	5-3/4	-	5-3/4	. General Fund
Los Angeles	6	1/2	6 1/2	. 1/2% for mass transit . Balance to General Fund
Miami	5	-	5	. General Fund
Milwaukee	5	-	5	. General Fund
New Orleans	2	7	9	. 2% to State General Fund . Balance split for city transit and school board
New York City	8	1/4	8-1/4	. General Fund
Philadelphia	6	-	6	. General Fund
Phoenix	6	-	6	. General Fund
Salt Lake City	5-3/4	-	5-3/4	. General Fund
San Antonio	4	1-1/2	5-1/2	. 5% to General Fund . 1/2% for mass transit
San Diego	6	-	6	. General Fund
San Francisco	6	1/2	6 1/2	. 6% to State General Fund . 1/2% for mass transit
Washington, D.C.	-	6	6	. General Fund

Source: Telephone Survey

EXHIBIT 13-3

COMPARATIVE FOOD AND BEVERAGE TAX RATES FOR MAJOR U.S. CITIES

City	Food and Beverage Tax Rate (%) General Sales Tax	Food & Bev. Tax	Other Taxes	Use of Revenue
Atlanta	5	-	3	. Same as General Sales Tax
Atlantic City	12	-	3 (liquor)	. General Fund
Chicago	8	-	-	. General Fund
Cleveland	5-1/2 to 8	-	-	. General Fund
Dallas	6	-	-	. Same as General Sales Tax
Detroit	4	-	-	. General Fund
Houston	6	-	-	. Same as General Sales Tax
Indianapolis	6	-	-	. Same as General Sales Tax
Las Vegas	5-3/4	-	-	. General Fund
Los Angeles	6-1/2	-	-	. Same as General Sales Tax
Miami	5	-	-	. General Fund
Milwaukee	5	-	-	. General Fund
New Orleans	9	-	5 (liquor)	. Same as General Sales Tax . Liquor tax entirely to City
New York City	8-1/4	-	-	. General Fund
Philadelphia	-	-	6 (liquor)	. General Fund
Phoenix	-	5	-	. General Fund
Salt Lake City	5-3/4	-	-	. General Fund
San Antonio	5-1/2	-	-	. Same as General Sales Tax
San Diego	6	-	-	. General Fund
San Francisco	6-1/2	-	-	. Same as General Sales Tax
Washington, D.C.	-	8	-	. General Fund

Source: Telephone Survey

EXHIBIT 13-4

COMPARATIVE HOTEL / MOTEL ROOM OCCUPANCY TAXES FOR MAJOR U.S. CITIES

City	Hotel/Motel Room Occupancy Tax						
	% or $	State	City	Total	General Sales Tax	Total Taxable	Use of Revenue
Atlanta	% .	3	-	3	5	8	. 20% Convention and Tourist Center with 5-10% increments until 50% maximum . Balance to General Fund
Atlantic City	%	-	-	-	12	12	. General Fund
Chicago	%	6	3	10.1	-	10.1	. City & State portion to General Fund . Balance (1.1%) goes for promotion of tourism Statewide
Cleveland	%	-	3	3	5-1/2 to 8	8-1/2 to 11	. General Municipal Fund
Dallas	%	3	5	8	-	8	. State: General Fund . City: 74%-Convention Ctr. 25%-Tourist Promo. 1%-Arts
Detroit	%	-	1	1	4	5	. Promotion
Houston	%	3	5	8	-	8	. State: General Fund . City: 74%-Convention Ctr. 25%-Tourist Promo. 1%-Arts
Indianapolis	%	-	9	9	6	15	. 4% of 9% for Convention Ctr. & Hoosier Dome . Balance to General Fund
Las Vegas	%	7	-	7	-	7	. 5/8 of 1% total tax for tourist promotion . 3/8 of 1% for advertising . Balance to General Fund
Los Angeles	%	-	10	10	6 1/2	16 1/2	. Less than 1% of 10% total for Convention Bureau . Balance to General Fund

EXHIBIT 13-4 (Continued)

COMPARATIVE HOTEL / MOTEL ROOM OCCUPANCY TAXES FOR MAJOR U.S. CITIES

	Hotel/Motel Room Occupancy Tax						
City	% or $	State	City	Total	General Sales Tax	Total Taxable	Use of Revenue
Miami	%	3	2	5	5	10	. 3% of 5% total for convention facilities development . 2% of 5% total for tourist development
Milwaukee	%	-	6	6	5	11	. 2% of 6% for Visitor Bur. . 2% of 6% for MECCA Convention Center . Balance to General Fund
New Orleans	%	2	9	11	-	11	. 4% for Superdome . 2% to Tourist Center . 1-1/2% for School Board . 2% to State . 1-1/2 % to City
New York City	$	Room Rate Tax 19.99 = 0.50 29.99 = 1.00 39.99 = 1.50 40.00 & up = 2.00	-	-	8 1/4	8 1/4 +	. General Fund
Philadelphia	%	6	3	9	6	15	. 6% of 9% total to State General Fund . 3% of 9% total to City for tourism
Phoenix	%	4	3	7	-	7	. 4% of 7% to State General Fund . 3% of 7% to City for promotion
Salt Lake City	%	3	1	4	5 3/4	9 3/4	. General Fund
San Antonio	%	3	5	8	-	8	. State: General Fund . City: 74%-Convention Ctr. 24%-Tourist promo. 1%-Arts

EXHIBIT 13-4 (Continued)

COMPARATIVE HOTEL / MOTEL ROOM OCCUPANCY TAXES FOR MAJOR U.S. CITIES

	Hotel/Motel Room Occupancy Tax						
City	% or $	State	City	Total	General Sales Tax	Total Taxable	Use of Revenue
San Diego	%	-	7	7	6	13	. 20% of total for tourist promotion . Balance to General Fund
San Francisco	%	-	9-3/4	9-3/4	6-1/2	16-1/4	. 20% of total for Convention Center . 20% of total for Promo. . 20% of total for low income housing . Balance to General Fund
Washington, D.C.	Both	-	10% & $1.00	10% & $1.00	-	10% & $1.00	. 10% to General Fund . $0.40 for Promotion . $0.60 to General Fund
AVERAGE - 22 CITIES:						10.5%	

Source: Telephone Survey

EXHIBIT 13-5

HISTORICAL MASSACHUSETTS HOTEL / MOTEL ROOM OCCUPANCY TAX REVENUES

Year	Tax Revenues ($ thousands)
1973	$ 8,027
1974	7,849
1975	9,665
1976	10,515
1977	11,050
1978	13,539
1979	15,526
1980	17,831
1981	22,094
1982	24,290
1983	26,200
1984 (Estimated)	28,000

Sources: Comptroller of the Commonwealth
Executive Office for Administration and Finance

EXHIBIT 13-6

ESTIMATED MASSACHUSETTS HOTEL / MOTEL TAX RECIEPTS AT VARIOUS HYPOTHETICAL TAX RATES
(Dollars in Thousands)

		ESTIMATED STATEWIDE REVENUE PROCEEDS AT HYPOTHETICAL TAX RATES					
		AT 8.0% (1)		AT 9.0% (2)		AT 10.0% (3)	
Calendar Year	At Current Rate of 5.7%	Gross Proceeds	Change From 5.7%	Gross Proceeds	Change From 5.7%	Gross Proceeds	Change From 5.7%
1984	$ 27,935	$ 27,935	$ 0	$ 27,935	$ 0	$ 27,935	$ 0
1985	30,677	37,007	6,331	39,760	9,083	42,512	11,835
1986	33,423	46,910	13,487	52,774	19,350	58,638	25,214
1987	36,326	50,984	14,658	57,357	21,031	63,730	27,404
1988	39,447	55,364	15,917	62,284	22,838	69,205	29,758
1989	42,801	60,071	17,271	67,580	24,779	75,089	32,288
1990	46,405	65,129	18,725	73,270	26,866	81,412	35,007
1991	50,275	70,562	20,287	79,382	29,107	88,202	37,927
1992	54,431	76,395	21,964	85,944	31,513	95,494	41,062
1993	58,893	82,656	23,764	92,988	34,096	103,320	44,428
1994	63,680	89,375	25,695	100,547	36,867	111,719	48,039
11 Year Totals	$484,292	$662,389	$178,096	$739,822	$255,530	$817,255	$332,963

Notes:

(1) Examples of areas with this approximate rate are: Atlanta, Cleveland, Houston, Las Vegas, Phoenix

(2) Examples of areas with this approximate rate are: Cleveland, Salt Lake City

(3) Examples of areas with this approximate rate or higher are: Atlantic City, Chicago, Los Angeles, Miami, New Orleans, New York City, Philadelphia, San Diego, San Francisco, Washington D.C.

Major Assumptions:

- Assumed effective date for new tax rate is 7/1/85
- Annual room growth of 1,000 per year for Boston metropolitan area and 2,000 per year for the entire state, including the Boston metropolitan area; approximately 60,000 rooms existed, statewide, at the end of 1983
- Annual inflation rate of 5.5% per year on room prices

EXHIBIT 13-7

ESTIMATED HOTEL/MOTEL ROOM OCCUPANCY TAXES AS A DIRECT SOURCE TO PAY ESTIMATED CONSTRUCTION COST FOR A NEW ARENA

(Dollars in Thousands)

YEAR	75% OF ADDITIONAL ESTIMATED TAX (1)	CONSTRUCTION COST PAYMENTS (2)	CURRENT PERIOD BORROWING REQUIREMENT (3)	MAXIMUM SHORT-TERM BORROWING (3)	INTEREST EARNED OR (PAID) (4)
1984	$ 0	$ 0	$ 0	$ 0	$ 0
1985	6,812	9,635	2,823	2,730	18
1986	14,513	12,600	(1,913)	755	116
1987	15,773	43,609	27,836	29,753	(1,960)
1988	17,128	37,889	20,761	54,999	(5,179)
1989	18,585	35,450	16,865	80,872	(8,222)
1990	20,149	2,443	(17,706)	76,976	(8,159)
1991	21,830	0	(21,830)	66,756	(6,159)
1992	23,635	0	(23,635)	51,218	(4,875
1993	25,572	0	(25,572)	31,987	(2,589)
1994	27,650	0	(27,650)	8,498	191
	$255,530	$141,626			($37,390)

Notes: (1) Amounts shown represent 75% of estimated new annual revenues that might be generated if the existing tax rate of 5.7% is raised to 9.0%, effective July 1, 1985.

(2) See Chapters 11 and 12 for supporting detail.

(3) The annual amounts shown are compilations of detailed quarterly calculations. The maximum short-term borrowing amount is the maximum that may be required to fund construction payments in excess of additional tax revenue receipts during any one of the quarterly periods for the years 1984 through 1994.

(4) Represents potential interest earnings or (payments) arising from an excess or (deficiency) of periodic tax revenue receipts over construction payments.

EXHIBIT 13-8

ESTIMATED HOTEL/MOTEL ROOM OCCUPANCY TAXES COMPARED TO ESTIMATED DEBT SERVICE ON GENERAL OBLIGATION BONDS ISSUED TO FINANCE CONSTRUCTION OF A NEW ARENA

(Dollars in Thousands)

YEAR	(A) 75% OF ADDITIONAL ESTIMATED TAX (1)	(B) DEBT SERVICE (2)	(C) SURPLUS (3)	(D) CUMULATIVE SURPLUS
1984	$ 0	$ 0	$ 0	$ 0
1985	6,812	0	6,812	6,812
1986	14,513	14,018	495	7,307
1987	15,773	12,015	3,758	11,065
1988	17,128	12,015	5,113	16,178
1989	18,585	12,015	6,570	22,748
1990	20,149	12,015	8,134	30,882
1991	21,830	12,015	9,815	40,697
1992	23,635	13,220	10,415	51,112
1993	25,572	13,219	12,353	63,465
1994	27,650	13,219	14,431	77,896

Notes: (1) See Note (1), Exhibit 13-7

(2) Estimated annual debt service on a general obligation-type bond issue; see Exhibit 13-1 and full text of report for a more detailed description of assumptions

(3) Difference between annual addition for receipts (column A) and estimated debt service payments (column B)

EXHIBIT 13-9

SUMMARY OF TRADE-OFF CONSIDERATIONS FOR "PRIVATE SECTOR" ARENA FINANCING OPTION

Private Financing Option	Trade-off Consideration: Source of Construction Cost Financing	Trade-off Consideration: Source of Debt Service Coverage	Comments
1. Contribution to building equipment and outfitting	X		
2. Sale or lease of development parcel	X	X	
3. Sale or long-term lease of arena name	X	X	
4. Charitable contributions/ fund drive	X		
5. Sale or lease of concourse suites	X	X	
6. Sale or lease of skyboxes	X	X	Also a trade-off with item (5)
7. Ticket surcharge		X	
8. Various lottery-type programs	X	X	
9. Seat preference bonds	X	X	Potentially lower coupon rate could reduce debt service requirements
10. Capital contributions from major tenants	X	X	Tenants' capital contributions might force lower rental costs
11. "Civic Bonds" (junior lien, below market debt instrument)	X	X	See comment under item (9)
12. Event co-promotion		X	

EXHIBIT 13 - 10

SUMMARY OF INDUSTRY SURVEY RESPONSES FROM ARENAS WITH SUITES (1)

RESPONDING ARENA	NUMBER OF SUITES	AVERAGE SEATING PER SUITE	AVERAGE ANNUAL SUITE RENTAL (2)	COMMENTS
1. Providence Civic Center	7	N/A	$ N/A	Presently being constructed
2. Pontiac Silverdome	102	12	10,000	Not relevant -- a stadium
3. Denver - McNichols Arena	28	11	30-40,000	Rental estimated from survey
4. Kansas City - Kemper Arena	23	18	4,500	
5. Houston Summit	20	15	29-33,000	
6. Hartford Civic Center	24	11	35,000	Recently added luxury boxes
7. Meadowlands Byrne Arena	29	N/A	100,000	2 reserved for team owners & mgmt.
8. Cleveland - Richfield Coliseum	92	10	N/A	
9. Nassau Coliseum	15	10	55,000	
10. Madison Square Garden	22	11	60,000	
11. Pittsburgh Civic Center	23	11	25,000	
12. Washington, D.C. - Capital Centre	76	8-21	N/A	
13. Atlanta - Omni	6	14	28,000	
14. Buffalo Memorial Auditorium	16	10	N/A	
15. Calgary - Olympic Saddle Dome	33	11	N/A	
16. Vancouver - Pacific Coliseum	14	22	34,000	
17. Quebec - Coliseum	42	6	4,200	
18. Boston Garden	36	12	30-35,000	Rent includes tickets to all pro sports and selected other events
Average, excluding Pontiac:	46	12	$37,000	

Notes: (1) Summary is based upon 40 arenas surveyed in total and 28 completed/returned surveys; only the arenas which responded and had suites are included on this exhibit.

(2) In most cases, respondents did not indicate whether ticket costs were included in suite rental charge.

N/A - No response provided

EXHIBIT 14-1

NEW ARENA CONSTRUCTION ECONOMIC IMPACT
(Dollars in Thousands)

	TOTAL	ENVIRONMENTAL IMPACT STUDY	DESIGN FEES	CONSTRUCTION MANAGEMENT	ARENA CONSTRUCTION	EQUIPMENT AND OUTFITTING	GARDEN DEMOLITION	GALLERIA CONSTRUCTION
MASSACHUSETTS PORTION								
LABOR	$ 64,751	$229	$4,643	$4,541	$49,833	$1,419	$3,085	$1,001
MATERIALS	25,078	-	-	-	23,191	1,420	-	467
SUBTOTAL	89,829	229	4,643	4,541	73,024	2,839	3,085	1,468
NON-MASSACHUSETTS PORTION								
LABOR	15,152	-	-	-	14,391	473	-	288
MATERIALS	8,359	-	-	-	7,731	473	-	155
SUBTOTAL	23,511	-	-	-	22,122	946	-	443
TOTAL	$113,340	$229	$4,643	$4,541	$95,146	$3,785	$3,085	$1,911

NOTE: NO ECONOMIC IMPACT HAS BEEN ATTRIBUTED TO GARDEN AND LAND ACQUISITION

ALL FIGURES INFLATED TO TIME OF EXPENDITURE

EXHIBIT 14-2

SUMMARY OF POTENTIAL ECONOMIC IMPACT
(City / State Portion Only)

	($ in 000's)		
	Existing Garden	Renovated Garden	New Arena
Construction: (1)			
• Employment	N/A	440 man-years	1,780 man-years
• Spending (3)	N/A	$36,280	$152,700
• State Tax Revenues	N/A	$ 1,240	$ 5,500
Annual Operations: (2)			
• Events	200	232	240
• Attendance (000)	2,160	2,600	2,800
• Annual Employment	140-170	140-170	140-170
• Spending (3)	$31,300	$37,000	$ 39,500
• City Revenues (PILOT)	$ 400	$ 400	$ 400
• State Revenues	$ 1,560	$ 1,840	$ 1,950
Spin-Off benefits:			
• Development Parcel Construction (1)			
– Employment	N/A	N/A	1,170 man-years
– Spending (3)	N/A	N/A	$138,700
– State Revenue	N/A	N/A	$ 5,000
– Linkage payment to city	N/A	N/A	$ 2,500
• Development Parcel-ongoing (2)			
– Employment	N/A	N/A	600
– Spending (net new) (3)	N/A	N/A	$ 16,200
– City Tax Revenues (new)	N/A	N/A	$ 2,400
– State Tax Revenues	N/A	N/A	$ 1,150
• Conventions requiring arena facility			
– State Tax Revenue	N/A	350	$ 350
Total Annual Benefits (1984 $)			
• Spending (3)	$31,300	$37,000	$ 55,700
• City Revenues	400	400	2,800
• State Revenues	1,560	2,190	3,450
Total	$33,260	$39,590	$ 61,950
Total Annual Benefits (1992 $)			
• Spending (3)	$48,000	$56,700	$ 85,500
• City Revenues	615	615	4,300
• State Revenues	2,400	3,350	5,300
Total	$50,015	$60,665	$ 95,100

NOTES: (1) Inflated to average year of construction for renovated Garden (1986) and Development Parcel (1994).
Inflated based on actual drawdowns for new arena.
(2) 1984 dollars
(3) Includes multiplier effect of 1.7.

N/A - Not Applicable

EXHIBIT 14-3

BOSTON GARDEN RENOVATION - CONSTRUCTION IMPACT
(Dollars in Thousands)

	1986 DOLLARS DIRECT IMPACT	TOTAL ECONOMIC IMPACT (1)
Massachusetts		
Labor	$14,560	$24,750
Materials	6,780	11,530
Sub-Total	$21,340	$36,280
Non-Massachusetts		
Labor	$ 4,200	$ 7,140
Materials	2,260	3,840
Sub-Total	$ 6,460	$10,980
Total Construction	$27,800	$47,260

(1) Direct Impact Times the 1.7 State Multiplier.

EXHIBIT 14-4

ECONOMIC IMPACT SUMMARY OF BASELINE ASSUMPTIONS
(Dollars in Thousands)

	EXISTING	RENOVATED	NEW
Number of Events	200	232	240
Attendees - Annual (000)	2,160	2,600	2,800
Concession - Total (including off-site parking)	$13,500	$16,250	$17,500
Salary & Wages - Operations	4,900	5,540	5,700
Operating Spending - Direct	$18,400	$21,790	$23,200
Employment - FTE	140-170	140-170	140-170
State Income Tax Rate	5.0%	5.0%	5.0%
Annual Rate of Inflation	5.5%	5.5%	5.5%
Hotel Tax Rate	5.7%	5.7%	5.7%
Taxes - State Sales	$675	$ 810	$ 875
- State Income	245	275	285
	$920	$1,085	$1,160

Note: This schedule reflects the direct impact only (1984 dollars), before multiplier effects.

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